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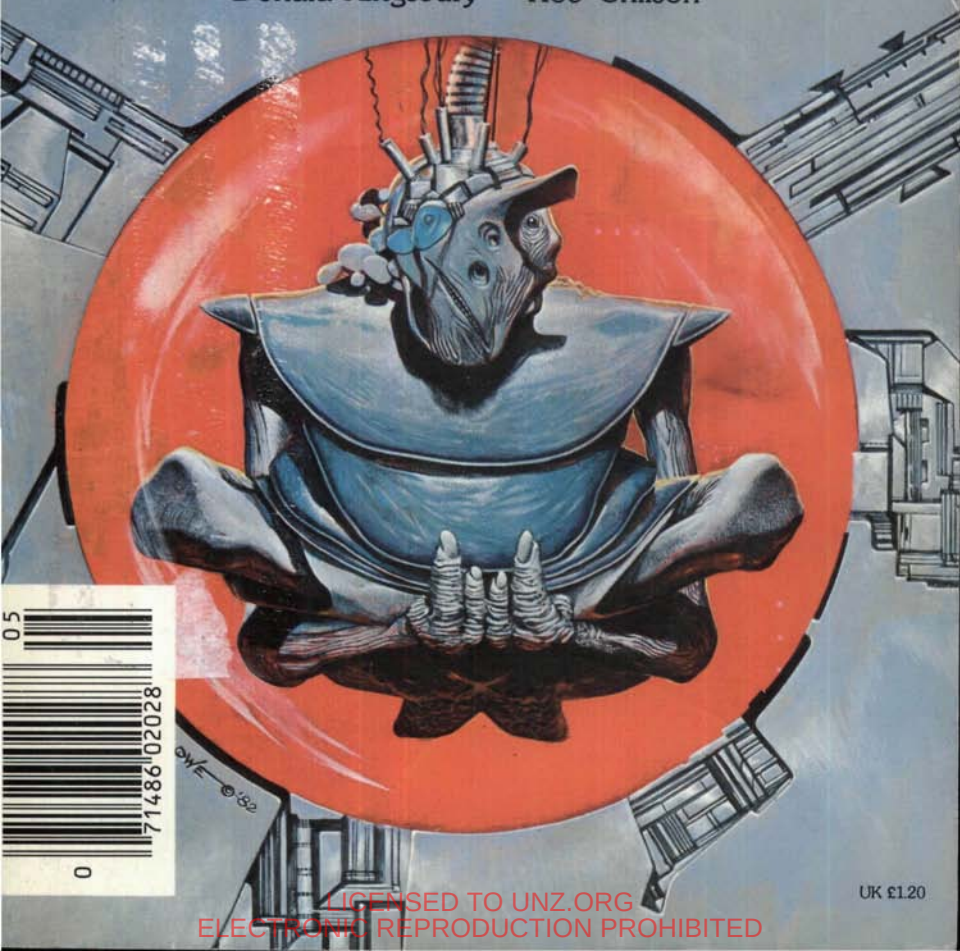

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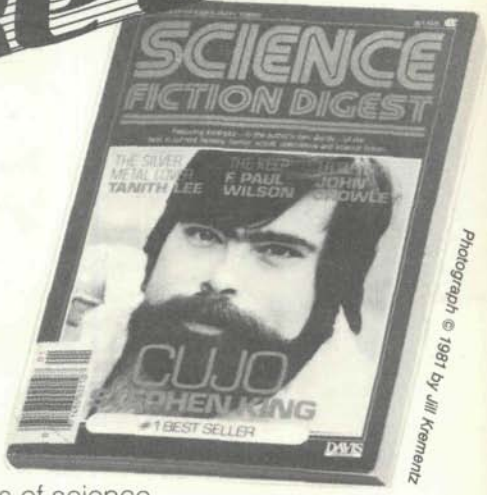

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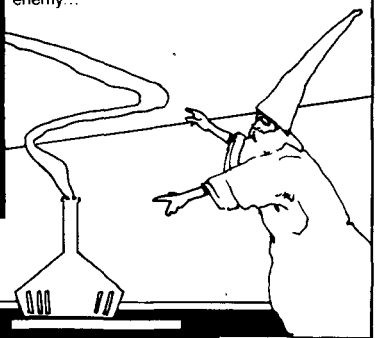

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CONTENTS

Novelettes

UNITIVE FACTOR, Timothy Zahn ____ 12

MEET ME AT APOGEE, Bill Johnson ____ 74

Serial

COURTSHIP RITE, Conclusion, Donald Kingsbury ____ 112

Science Fact

STOCKING THE GALLEY OF SPACESHIP EARTH, Dr. Mark S. Lesney ____ 37

Short Stories

THE CONFESSIONAL, Russell M. Griffin ____ 50

NEEDLE AND THREAD, Thomas A. Easton ____ 64

WALK WITH ME, Rob Chilson ____ 94

Reader's Departments

THE EDITOR'S PAGE ____ 5

IN TIMES TO COME ____ 103

THE ALTERNATE VIEW, G. Harry Stine ____ 107

THE ANALOG CALENDAR OF UPCOMING EVENTS ____ 111

BIOLOG ____ 163

THE REFERENCE LIBRARY, Tom Easton ____ 164

BRASS TACKS ____ 171

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Editorial

The TISATAAFL Trap

Stanley Schmidt

There is a wise old saying which applies to so many situations that the inhabitants of Robert A. Heinlein's lunar colony in *The Moon Is a Harsh Mistress* condensed it into a single frequently used word: TANSTAAFL. In this form it is quite familiar to readers of science fiction, and most of *us* know that it stands for, "There ain't no such thing as a free lunch (or anything else)." Most of us even recognize that this is a statement of profound truth and great generality. It can be considered, in fact, one possible plain-English statement of the first law of thermodynamics, which is about as general as you can get.

Much of the populace at large pays lip service to the *tanstaafl* sentiment, but the *idea* doesn't seem to have caught on. If people really believed it—and understood it—how many of them could have bought a presidential campaign based on promises to cut taxes *and* increase defense spending *and* balance the budget? (Even as I write this, the newspapers are beginning to speak of a possible federal sales tax to support the defense increases. . . .)

The widespread gut feeling that there *is* such a thing as a free lunch is surely one of the best friends not only of politicians but of businessmen of all stripes. Life insurance salesmen generously offer policies which will not only protect your surviving spouse's interest in your home, should you meet an untimely end, but will pay off your mortgage before its time, save you a bundle, and even give you a cozy retirement income if you *don't* meet such an end. Used car salesmen offer cars with warranties that sound too good to be true—and probably are. Airlines offer free drinks to passengers; restaurants offer free *hors d'oeuvres* with "Happy Hour" drinks. Savings banks vie to give the best "free gifts" to customers who open new accounts.

All of these people, and many more in the same vein, find plenty of takers to make their strategies profitable. It seems (fortunately for them) that few people bother to investigate whether the insurance policy can *really* do all that it claims as well as a combination of simple term insurance plus other investments chosen with a modicum of thought. Few people seem to notice that either the car is priced so far above the

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going rate that they're not likely to recover the difference in warranty repairs, or the warranty is so loaded with restrictions as to be nearly worthless—or both. Few passengers seem to realize that they're paying for the "free" drink whether they take it or not and could fly a little cheaper if they neither drank nor paid for the privilege. Hardly anybody seems to care that the Happy Hour drinks could cost less if the *hors d'oeuvres* weren't "free," or that money spent on free gifts might better be applied to higher interest rates.

Now, you may maintain that most of these Recipients of Magnanimity are more astute than I give them credit for—that they do understand what's going on and consider the hidden trades fair and worthwhile. You might suppose, for example, that most airline travelers are perfectly content to include the price of a soft drink in their fares, for the convenience of being able to get it without the bother of handling money en route. This may even be true; and certainly many people accept these practices because they are so widespread and there doesn't seem to be much chance of changing them. But these observations overlook at least three more insidious elements of this way of doing business:

1. When a charge is hidden inside another charge, even the customer who recognizes that it *is* a charge is in a poor position to judge whether it's the right size for the product or service delivered.
2. When an auxiliary charge is incorporated into a basic one, the customer who doesn't want the extra has no choice. He doesn't have to take it—but he does have to pay for it.
3. *Tanstaafl* means that *somebody* has to pay for every lunch—but it may not be the person who eats it. The more deeply hidden the charge, the more genuinely attractive a deal looks, the more likely it is that somebody is unwittingly and involuntarily subsidizing somebody else. This may mean that somebody else is picking up your tab—but it may also mean that *you* are buying somebody else's "freebies."

This last effect is perhaps the most irksome to those who recognize that it's happening—and happen to be on the wrong end of the subsidy. The fact that those passengers who don't partake are buying for those who do is a very minor example. Far less innocuous ones are easily found—and one need look no further than the airlines to find them. The immediate provocation for this editorial, in fact, was a bit of research I did while contemplating a round trip from New York to Cincinnati and Detroit.

In case you haven't shopped for airline tickets lately, let me point out that it has become a considerably trickier game than it used to be. The first shock I received was learning that the best fare for the Cincinnati leg of the trip had risen from $78 to $141 in the space of four months. Since this figures out to an annual inflation rate of some 490%—a bit out of line with even the prevailing gallop—I thought an explanation was in order, so I called an airline representative and asked for one. I was told

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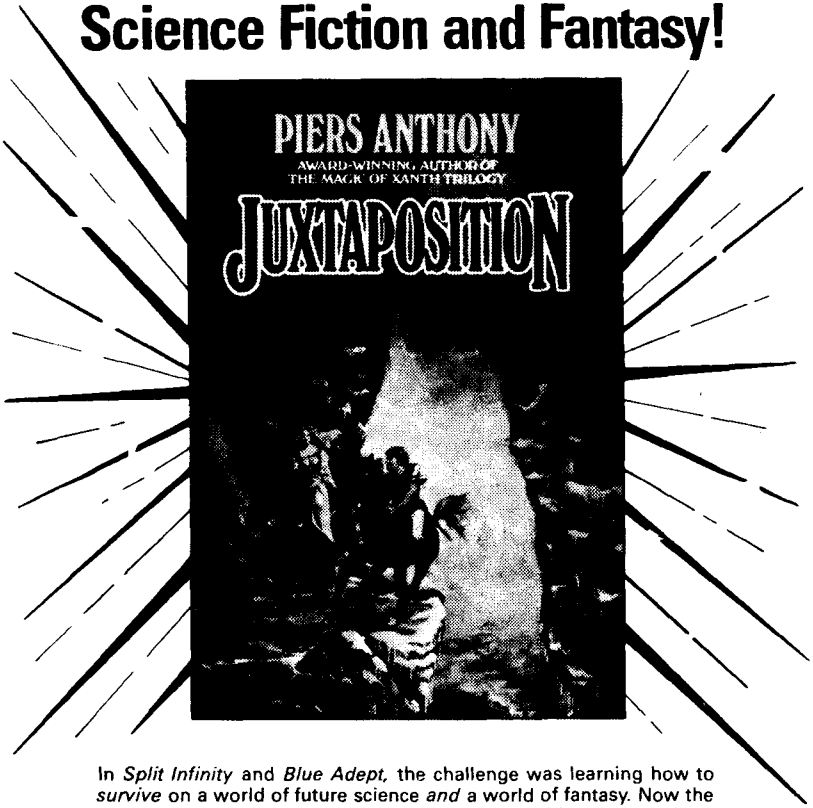

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that last June's rate had been an unusually low "special" and the current rate was "back to normal"—a theory not entirely consistent with extrapolations from past experience, but let that pass. When I let it be known that I considered the increase unconscionable and planned to express my disapproval by finding other ways to get where I was going—or not going at all—the agent began suggesting alternate ways I might structure my trip to take advantage of special fares currently available to some cities to obtain a lower total (and thereby keep the company from losing my business altogether). These alternatives were marvelous in their complexity, deviousness, and diversity, and some also included an amusing element of chance. All were significantly less convenient than what I really wanted to do. The one that gave the best round trip fare involved buying two separate round-trip tickets and going to Cincinnati via Detroit. That gave a total fare of $251, as compared to $314 by the preferred route—but if the first flight happened to be late and cause me to miss the second, that $251 would jump an abrupt 53% to $384 (and I wouldn't know until I got to Detroit).

If all this begins to sound a little like a gambling casino with the odds in the house's favor, I'm not surprised. It smells even worse when you take a closer look at the fares available for the individual legs of the trip. New York to Cincinnati is approximately 544 air miles; New York to Detroit is 461. The lowest day coach fare I could get between New York and Cincinnati was $141, while New York to Detroit was available (to a lucky few) at $59. That means Detroit was being offered at 13¢ per mile, but Cincinnati cost 26¢—or *twice* as much!

This is peachy if you happen to want to go to Detroit and not Cincinnati, but I daresay the person who needs to go to Cincinnati and has no interest in Detroit has ample cause for complaint. Just what is going on here? I see two pos-

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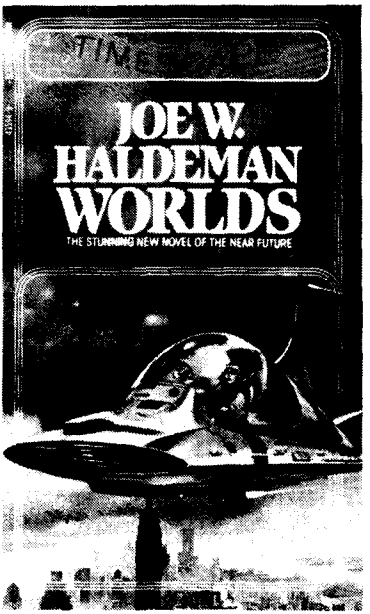

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sibilities. One is that the Detroit fare is actually reasonable, based on costs and a decent profit—in which case the "normal" fares would seem to be unjustifiably high.* The other possibility —which I strongly suspect is at least part of the real explanation—is that the airlines periodically offer artificially low fares on certain runs to drum up business. Unfortunately, this necessitates jacking other fares up artificially high to make up the loss.

It may be argued that on the particular trip I mentioned (if I use the chancy configuration) I have no cause for complaint because my own overpriced Cincinnati trip pays the subsidy on my underpriced Detroit trip. However, relatively few passengers are in such a situation, and that argument misses the point anyway. The point is that whenever one group of customers gets something for less than its market value, another group *has* to be overcharged to pay for it.

A similar argument has been advanced for outlawing the discount coupons prevalent in supermarkets. There is a similarity; it's hard to believe that normal grocery prices aren't a bit higher than they would be if some customers weren't getting a break. But there's also a difference. Nobody *has* to pay the full market price for an item for which a coupon is available. He will do so only if the savings are unimportant to him (in which case he needs no sympathy), or if he's too lazy to take advantage of it or too stupid to recognize that it *is* an advantage. He has a choice. The airline passenger who has to go to Cincinnati and is forced to help pay somebody else's way to Detroit does not. One could claim, without too much levity or exaggeration, that supermarket coupons are one of the few evolutionary influences (albeit a very weak one) still allowed to operate in our civilization. The airline fare structure is a simple case of robbing Peter to pay Paul.

There is one other distinction I must make. Already I can hear the howls of accusation that I want to eliminate competition from business. Emphatically not so; what I'm describing has nothing to do with competition. I'm all for competition which allows one company to attract business by offering a better product at a lower price than another. That's why, several years ago, I heartily seconded John Campbell's opposition to "fair trade" laws which would force everybody selling a given product to sell it at the same price. By all means, let them vie with each other to run their businesses efficiently enough to be *able* to offer the best deal—and let consumers assume the complementary responsibility of comparison shopping to keep the merchants on their toes. But please, *don't* let the same merchant offer the same product to one group of customers at half the price he charges another. *That* is what I'm objecting to.

I'm not really sure what to suggest to improve things. The easy way out is

*The recent proliferation of small airlines offering "no-frill" service at low *standard* fares would seem to support this theory—but it may not. I'm told that they hold passenger fares down by carrying lots of freight (which, of course, is just another configuration of one group of customers subsidizing another).

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government regulation, but that has so many attendant evils that I'd rather see no more of it than absolutely necessary. What I'd rather see is something much more radical, hard to achieve, and ultimately worthwhile. I'd like to see a populace instill in its members the fundamental conviction that prices of goods and services should be rather closely proportional to their actual values and costs. If merchants consider it unethical to deviate far from this principle, and customers refuse to put up with it, it should happen less often.

These days, sadly, the idea of the members of a society regulating their own behavior on the basis of deeply rooted belief in principles has come to be regarded as quaint and naive and impractical. But it has worked in some times and places, and it just might be worth another try. It can only work, though, if large numbers of individuals take personal responsibility for making it work.

As a start, we might all be better off if we all really grasped the profound truth of TANSTAAFL. And if you don't mind, I'd rather pay for mine and let you pay for yours. ■

A NOTICE TO *ANALOG* READERS:

If you're puzzling over
this issue's "May" cover date—recall that last issue's
was March 29—it's because we've switched to a
monthly dating system. You'll continue to see
thirteen issues annually. Twelve will be
dated "January" through "December."
The thirteenth—which
will, of course,
include the regular selection of stories and
features—will bear
a different designation, yet to be decided
upon. (The change is being made
in response to our circulation
department, which
informs us that magazines carrying "month"
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on the newsstands longer.)
So, to repeat: 1982 is The Year
Without An April, for *Analog*.
You have not missed an issue;
"June" through "December" will
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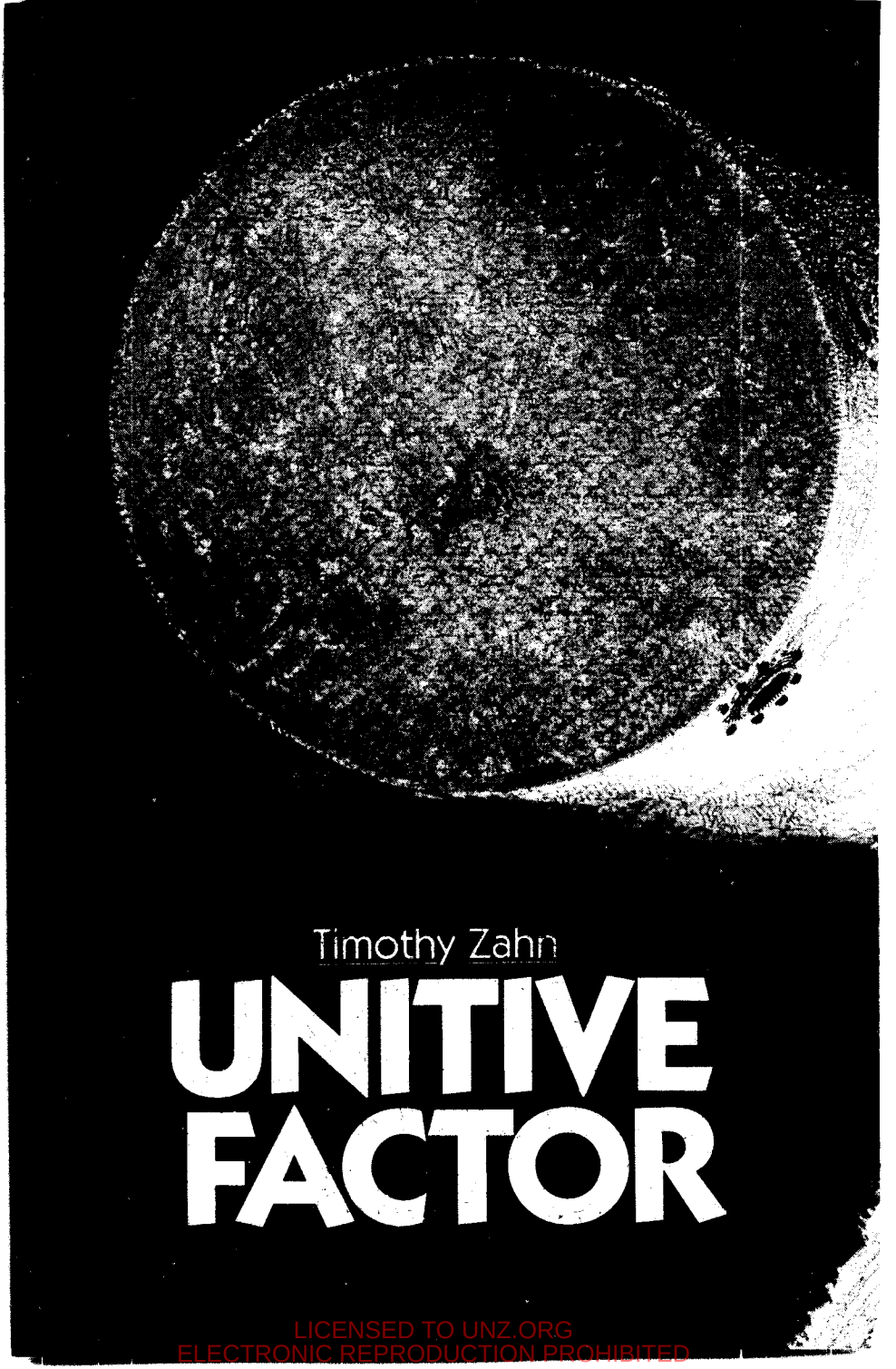

Timothy Zahn

UNITIVE FACTOR

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The phrase
"horse and buggy"
epitomizes the
notion of an idea
whose time has passed.
Or does it?

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". . . Although I feel the experience was worthwhile, I don't think I would enjoy working with the Tampies again. There are just too many differences, too many ways for us to irritate each other."

Alone in his quarters, Captain Harl Roman sighed as the words flowing across the computer screen ceased. That was the last of them. Now came the moment he'd been dreading: the computer's scorecard. Punching the appropriate key, he watched as the results were printed out. Twenty-eight favorable, ninety-seven unfavorable, as compared to an original score of sixty to sixty-five. Nearly twenty-six percent of the *Amity*'s crew had switched sides.

"Damn," he muttered.

There was a tap on the door. "Come," he called, and the panel slid open to reveal the *Amity*'s first officer, Commander Lee Chen. He had a squeeze bottle in his hand.

"Jump to Kestler system completed, sir," he said, saluting. "Final Jump to Solomon will be in approximately forty minutes, or whenever Pegasus is ready."

"Come on in. You could have reported all this from the bridge, you know."

"Yeah, but I figured you might be feeling a little low, skipper, and this stuff doesn't transmit well via intercom." He waved the bottle as he walked easily across the floor in his velgrip slippers.

Roman grunted as he undid the straps that held him in his chair and started a search for glasses. "You've read the questionnaires, I gather?"

"I looked at the final tally. Not too good, is it?"

"It's terrible. The whole experiment's essentially blown up in our faces. The pro-Tampy faction might as well turn in their cards and resign from office."

"Oh, come on—it's not *that* bad. So a quarter of the crew feels less friendly toward the Tampies than when we left. It's not like we had fights breaking out every ten minutes or something. Besides, the government's not going to do anything on the basis of *one* mixed-crew mission."

"Of course not." Roman found two small zeegee glasses and returned to his chair. "But at the same time, I don't think you've ever fully grasped just how much of their stock the pro-Tampies have sunk into the *Amity*. This was their first real political initiative in a good two years, and it was supposed to give them at least some straws to grasp at. Now they're going to be more on the defensive than ever."

Chen grunted and squeezed them each a drink. For a moment they sipped from the tubes in silence. "That's good stuff," Roman commented.

"Guaranteed to drain your sinuses," Chen said, refilling the glasses. "So what happens now? We all give up and have our war?"

"Eventually. Not this month, but eventually. The noise from the frontier worlds is already too loud for Earth to ignore."

"You make it sound like we don't have legitimate grievances," Chen said mildly. "The Tampies don't *need* all the worlds they're grabbing up, you know—they're just doing it to keep *us* off them."

"Or at least to keep the miners and more gung-ho developers off them."

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"Same difference. We need minerals, cropland, and general living space—park planets are a luxury."

"I suppose so." Roman eyed the other quizzically. "You never actually worked with any Tampies before this mission, did you? How do you feel about them?"

"I feel they're lazy, dog-in-the-manger goof-offs who are strangling our worlds with their overprotective attitude toward dumb animals and plants," Chen said promptly.

Roman was stunned. But before he could speak, Chen smiled wryly. "That's what I *feel;* gut-level response. What I *think*—well, I guess I'm still a little ambivalent on the subject. But mostly I think they're pretty strange by human standards, but that we could learn a hell of a lot from them if we could accept their differences. Most of my neighbors on Prepyat would disagree with that, of course."

"You had me worried for a minute. You're right, though, that's the way the Tampies look to a lot of people—on Earth as well as at the frontier. I think the human race has gotten so used to running our technology at right angles to nature we've forgotten that active cooperation sometimes pays off a hell of a lot better."

Chen looked out the viewport. "And presenting the world's biggest object lesson . . ."

Roman shifted his own gaze to the viewport and nodded silently. Even a kilometer away, Pegasus, *Amity*'s space horse, was an impressive sight. More than anything else it resembled a tapered, somewhat flexible eight-hundred-meter-long cylinder with rounded ends. An axial ring near each end held the creature's sensory clusters; and even as they watched, a speck of a boulder drifted in toward one of the clusters, was guided deftly through the gently glowing webbing that linked Pegasus to the ship, and vanished into the cluster's feeding orifice.

"Lunchtime," Chen murmured. "Did I ever mention, skipper, that my father was on the first human ship to run across a space horse?"

Roman looked at him in surprise. "Your father was on the *Taurus?* I didn't know that."

"No—the *Taurus* just made the first *official* sighting. A little backwater freighter called the *Random Walk* saw one almost six months earlier." Chen nodded out at Pegasus. "It was sitting in one of Caravel's Lagrange points, telekening dust and rocks into its orifices. The *Random Walk*'s crew was so intent on figuring out what was moving the stuff that they were practically on top of the horse—relatively speaking—before they realized it wasn't just a big inert mass. Before they could get their scanners refocused, the thing spooked and Jumped, leaving them with nothing but a wild story and some *very* interesting nightmares."

Despite the gloom he was feeling, Roman chuckled. "I'll bet. And, naturally, no one believed them."

"Would you have? Of course, once the *Taurus* brought back its films the *Random Walk*'s story was vindicated; but the *Taurus* still got all the honors." Chen reached for the squeeze bottle again. "I'm a little surprised the pro-Tampies don't sing the praises of the space horse more often in their

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speeches—it's about the only economic argument they have to fall back on."

"True." Roman shook his head as Chen proffered the bottle. "Unfortunately, it's an argument that anyone can shoot holes in. As long as we can't communicate directly with the horses—or keep them alive for more than a month, for that matter—we're going to be stuck with Tampy horses and Tampy Handlers. With the situation so uncertain no one really wants to turn over much of our interstellar shipping to them—though I seem to remember hearing that companies who rent horse-plus-Handler teams usually do so again, despite the horrendous cost." He sipped his drink. "You have to remember, Lee, that while our economy could really use more space horses, there's practically nothing the Tampies need in return from *us*. If they broke off all communication with us tomorrow they'd hardly even notice. We have to stay equally unentangled with them, for both defensive and political reasons."

"What about the fact we're better at capturing space horses than they are?" Chen objected. He nodded toward Pegasus. "And even the Tampies admit our web is better than theirs."

"Those are very minor arguments. Sure, it would be handy if they could capture more space horses. Even the Tampies can't get them to breed in captivity, you know, and almost eight percent of their interstellar traffic consists of hunting parties. But they could easily live without our trapping techniques or our webs. Or our fusion drives, fertilizers, or plastics."

"Or us," Chen nodded. "A classic impasse: they don't need us, and we can't afford to need them. And we don't especially like each other."

"*And* there are only so many habitable planets at our common frontier—" A buzz from the intercom interrupted Roman. "Captain here."

"Bridge, sir. A distress call has just been relayed to us from the tachyon receiver on Kestler." The communications officer looked unusually grim. "A research group at NAL 1148 needs emergency transport. Their star is apparently starting to go nova."

Chen muttered a short obscenity and drained the last of his drink. Roman stuck his glass to a patch on his desk. "On our way," he said. "Alert the Tampies; I want to be able to Jump the second Pegasus is ready."

More information was waiting when Roman and Chen reached the bridge. "The group of fifty is headed by a Dr. Jamen Lowry. It was set up at NAL 1148 because the star was thought to be in a pre-nova stage and they wanted to study it. Apparently the thing is going off much sooner than theory predicted. Their rented transport ship is on its way to get them, but it was based at another research station eight light-years away. It's only got a conventional star drive, of course."

"That puts them over a week away," Roman nodded, frowning. "How close are we?"

"Depends on how many Jumps we have to make," Chen said from his station. The relevant page of the New Arcturus List was displayed on his console. "We're nearly two hundred eighty light-years away from there, but if Pegasus can see it . . ." He ran his fingers along the keys. "Nope. Damn. But . . . yes,

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it should be able to see Spica from here and it *can* pick out 1148 from there. Two Jumps will do it, Captain. Two hours, or maybe three—Pegasus has been sluggish lately."

Two hundred eighty light-years in three hours. And there were *still* people who didn't see any advantages in cooperation with the Tampies. "All right," Roman told him. "Send the coordinates and maps down to Sso-ngii and tell him we want to Jump as soon as possible. And have Kestler send word to Solomon that our homecoming ceremonies will have to be delayed for a few days." The others moved to obey, and a thought struck Roman. He hesitated for a second, then touched a button on his intercom. The screen lit up a minute or so later to show a lopsided face, cranial hair tufts, and a yellow-orange tartan neckerchief. "Rrin-saa? This is Captain Roman."

"Rro-maa, yes?" the Tampy replied in a grating voice.

"We're about to leave on a rescue mission to pick up a research group near a star that's going nova."

"I have heard."

"Do you have any idea how the space horse will react to this? I know they absorb radiant energy and particles as one of their power sources, but will a nova or pre-nova be too bright for safety?"

"I do not know. I know they come close to normal stars; that is all."

So speculate, damn it. He wouldn't, of course, and Roman knew better than to push him. Tampies never speculated on the possible activities of any creature in a new situation, at least not out loud. Part of their respect for other forms of life, the experts thought. "All right," Roman said instead. "I'd appreciate it if you would make sure your people work with top efficiency. Every second counts."

"I do not rule; but I will relay your words," Rrin-saa replied.

"Right." Officially, Rrin-saa was only the Tampies' spokesman. If the aliens had an organized political system aboard ship, Roman had never figured it out. "Thanks. Out."

The screen went blank. At the helm, Lieutenant Erin Kennedy half-turned toward Roman. "Sso-ngii signals Pegasus is ready, Captain," she announced.

Roman nodded. "Jump."

NAL 1148 was a double star system, consisting of a smallish red giant and a white dwarf plus three planets of various sizes and orbits. The two stars were so close together—the dwarf circling perilously close to the giant's outer atmosphere—that there was little room for a stable planetary orbit between them. All the planets revolved around both stars; the perturbations caused by this arrangement were enough to render the computer's meager data on the system useless. It took nearly two hours of searching before *Amity*'s telescopes could locate their target, the unnamed innermost planet, quickly dubbed "Uno" by Roman's bridge crew.

"It's about five hundred million kilometers from the center of the giant," Scanner Chief Marlowe reported, tapping a switch. Perpendicular arrows appeared on Roman's monitor screen, off to the right of the two stars. "Almost sixty-seven hundred kilometers in di-

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ameter—about Mars-sized—with one moon. We landed practically on top of it—we're only about forty million kilometers away."

"Damn close, considering we were Jumping blind," Kennedy commented.

Roman nodded. "What's the status of those stars?"

Chen glanced up from his computer screen, taking care not to dislodge his intercom headset, and Roman gave silent thanks *Amity*'s mission had been one of planetary discovery and exploration. A normal military rescue ship wouldn't have had the scientific equipment and personnel for this job. "Both stars, especially B—the dwarf—are much hotter than they should be. B is cooling down fairly rapidly, though. The science deck isn't exactly sure what's happening but they suggest the following scenario. Some of the gas envelope material from A—the giant—falls onto B and triggers a burst of energy, which both heats B's surface and blows off a shell of material. The extra radiant energy now heats up A slightly, causing it to expand a bit and therefore dump *more* material onto B. Eventually, they say, one of these cycles will dump enough matter on B to trigger a proton-proton nuclear reaction in the atmosphere. At that point B goes nova, increases its brightness a factor of fifty thousand or so, and fries everything in the system." Chen paused for a moment, apparently listening to something. "The best guess from the astrophysicists is that the last of these 'burps' happened sixty to eighty hours ago and that another could happen at any time."

"Thank you." Roman swiveled in his chair. "How's the ship taking this?"

"Skin temperature's going up, but not dangerously, Captain," the ensign at the engineering monitor reported. Dangerous or not, he wasn't taking his eyes off the readouts. "As long as B continues to cool down we should be all right. Particle radiation is marginal, just within safety limits."

Roman nodded. If worse came to worse they could turn sternward to B—the fusion drive nacelles were better able to take high temperatures than the hull was—or even move into Pegasus's shadow. The problem now was time. "Can you give me an estimate as to when we can expect the nova to go off?"

Chen shrugged. "They're tossing around a lot of stuff about accretion disks, expansion coefficients, and Lagrange surfaces, but it boils down to the fact that they don't know. It could be the very next burp that triggers it, or it may hold off for a couple of weeks."

"Um. All right. Kennedy, alert Ssongii and set up a course to Uno; minimum time, but keep it under two gees." Pegasus could tow the *Amity* through normal space at better than twice that acceleration, but the Tampies couldn't take anything much higher than two gees for long periods of time. "Get us moving as soon as possible."

"Captain, Hhom-jee is reporting trouble with getting Pegasus to move," Kennedy said.

Roman touched an intercom button. "Bridge to Handler. What's the problem?"

The face that appeared looked like all Tampy faces, but the green-and-purple

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neckerchief belonged to Hhom-jee, the assistant Handler. "Horse does not wish to move," he said shortly. "I will not force him."

"Look, we're in an emergency situation here. Where is Sso-ngii?"

"Kken-nee already say emergency. Sso-ngii is resting."

"Is the horse afraid to move closer to the hot star? Perhaps we can shield—"

"Horse does not wish to move *any* direction," Hhom-jee insisted. "He may not be well."

Every head turned at that one, and Roman felt something tighten in his stomach. *Amity* had no interstellar drive of her own. If anything happened to Pegasus they were trapped in this system.

"I'm coming down," he told the Tampy, and broke the connection.

The airlock connecting the human and Tampy sides of the ship had seen a lot of traffic in the first few weeks of the voyage, but had been used less and less as the two races gradually withdrew from each other. Signing out a filter mask—the odors from the Tampy section were somewhat disagreeable to humans, and vice versa—Roman quickly cycled through the lock and headed down the hallway. Newcomers were always shocked by the green-gray moss that covered every bit of floor, wall, and ceiling space not otherwise being used, and were usually even more shocked to discover the moss was the Tampies' air regeneration system. Roman hardly noticed it, but concentrated on moving along the handholds as quickly as possible.

Three Tampies were in the Handlers' room when he arrived. "Hhom-jee informed me you were coming," spokesman Rrin-saa greeted Roman, as the latter found one of the few patches of velgrip the Tampies had allowed in their section and planted his feet onto it.

"Hhom-jee informed *me* the space horse was sick," Roman returned. Hhom-jee himself had ignored Roman's entrance and was sitting in mid-air by the room's only viewport, wearing the multi-wired helmet that connected him to Pegasus via the webbing. Sso-ngii, the chief Handler, floated in a corner, eyes wide open, humming to himself. Resting, Tampy style.

"We do not know if he is sick," Rrin-saa said. "More likely he is simply disturbed by the changing light of the star and does not wish to move yet."

"It's going to have to move soon, like it or not," Roman said bluntly. "There are fifty humans trapped on a planet out there and we've got to get them off and out of here."

"Your feelings are understood by us. There is also a Tamplisstan observation station on that planet."

Roman blinked. It had never occurred to him that the Tampies might also be interested in a pre-nova star. "Why didn't you say something about this earlier?"

"I was not asked. But did you think we Jumped so near the planet by accident? We knew approximately where it was."

"I didn't know you could fine-tune a Jump that well. But never mind that now." Roman nodded toward Sso-ngii's corner. "If Hhom-jee can't get the horse to move, perhaps Sso-ngii can."

"I do not think so. He will not wish

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to use compulsion; nor do I think it will be effective."

"Try it anyway."

Rrin-saa glanced at Sso-ngii. "He is resting now and cannot be disturbed."

Roman took a deep breath and forced his mind to remain calm. *Sso-ngii is* not *goofing off*, he told himself sternly. *He's resting, just like we have to sleep. He's* not *goldbricking*. It helped a little. "Rrin-saa. I know your ways are not the same as ours, but you agreed to this experiment in cooperation and furthermore agreed that I would be in ultimate command on this ship. We have no time to waste; that star could go nova at any moment. I *order* you to have Sso-ngii contact the space horse."

For a long moment Rrin-saa remained silent and motionless. Then, slowly, he went to Sso-ngii and touched him on the arm, speaking softly in the Tampy language. The tune stopped; Sso-ngii shook himself like a wet terrier and rubbed his neck. Rrin-saa said something else. The Handler gazed at Roman and then went to where Hhom-jee sat, relieving him of the helmet.

"He will try now," Rrin-saa said to Roman, no trace of any emotion in his voice.

Roman nodded, and for a few minutes there was silence in the room. Then Sso-ngii turned from the viewport. "The horse will not move," he said. "I can use no stronger compulsion than I have just done," he added, looking at Roman.

Roman gnawed his lower lip. "Keep trying. I'm going back to the bridge. If you can't get it to move in the next few minutes we'll have to try something else."

He left. The idea that had occurred to him would take time to set in motion and he could have given the preliminary orders from the Tampy section. But the plan was a desperate one, and he wanted a few minutes to try and come up with something better.

Inspiration hadn't struck by the time he reached the bridge; nor had Pegasus showed signs of budging. Nodding receipt of the latter information, Roman touched an intercom button. "Engine room; Stolt," came the prompt response.

"How soon can you have the fusion drive operating?"

"Well, it's been down for the past few months, Captain, except for routine checks. It'll take about an hour to do a proper cold start."

"Begin immediately," Roman ordered. "And don't cut any safety corners—it'll be at least an hour before we're ready to leave, anyway."

He disconnected, and looked up to see Chen at his shoulder. "Captain, if you're thinking of dragging Pegasus along with us, I don't think the drive can do it. Especially if Pegasus doesn't want to go anywhere."

"I know. I'm intending to cut *Amity* loose from Pegasus and go in without it."

Chen's eyes widened fractionally, and when he spoke it was almost in a whisper. "Skipper, you can't do that. You turn a space horse loose and it'll Jump."

"Don't worry, I haven't dropped any parity bits. What I'm proposing is to keep Pegasus webbed and to leave a couple of lifeboats full of Tampies to ride herd on it. I figure a dozen or so

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should be able to keep it here; we can ask Sso-ngii about that. I can then take *Amity* in, pick up the scientists, and return."

Chen shook his head. "That's still way too risky, Captain. What if the Tampies Jump and strand us here?"

Roman cocked an eyebrow. "Come on now, Lee—you know they won't do that."

The other's lips compressed tightly together, and Roman saw the ghosts of frontier prejudices chasing each other across his face. "I . . . guess not," Chen said at last. Reluctantly. "But the Tampies aren't going to like being cooped up in our lifeboats that long, you know."

"True, but they're a pretty adaptable bunch. They'll be okay."

"Yes, sir." The tone was neutral and decidedly unconvinced.

And if Lee Chen wasn't convinced . . . Roman thought about those ninety-seven unfavorable questionnaires and adjusted his plans slightly. "I'll also want to leave a contingent of humans on the boats, of course, since the Tampies haven't had much experience with our equipment. I'm putting you in charge of the group—"

"*Me*, sir?" For an instant a look of something like disgust flashed across Chen's face.

"Yes, you. I want the list of people you'll be taking with you within half an hour. Make sure it's a compatible bunch—I know *Amity*'s got her share of squabbles, and we can't afford any friction on the boats. There's no room for it."

"That'll be no problem, sir—the crew pulls together pretty well in a crisis." Chen hesitated. "With due respect, though, I think I would be more useful if I stayed on the ship."

Roman shook his head, "Sorry, but I need someone with command authority to stay with Pegasus. Get busy with your preparations; we're running low on time."

"Yes, sir," Chen said, his voice stiff with internal tension. He returned to his station without further comment.

Which was just as well. The crucial question didn't seem to have occurred to him yet, and Roman wanted to have an answer before it did. The computer's opinion, delivered a few moments later, was clear but ominous: *Amity* could survive the trip to Uno, even without using Pegasus as a shield, but only as long as B's energy output did not increase significantly. At two gees it would take them over twenty-five hours each way, and the white dwarf's next burp could come at any time. If it happened in the next fifty hours *Amity* was going to fry.

Jabbing at his intercom, Roman began giving orders.

The ship was still four hundred thousand kilometers from Uno, and Roman was catnapping in his chair, when B burped.

"You're sure?" Roman frowned, studying his screens as he brushed the sleep-induced cobwebs from his brain. B's light output seemed the same to him.

"Yes, sir." Hunched over his scanners, Marlowe tapped a switch and a velocity plot appeared on Roman's screen. "A thin shell of matter has been blown off and is expanding outwards at nearly four hundred kilometers per sec-

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ond. It's blocking B's extra brightness from us, but only temporarily. As soon as it spreads itself thin enough for the light to get through . . . well, we'll be in some trouble. No more than a few minutes, I'd say."

Marlowe had a definite gift for understatement. Roman punched for course status and read the numbers with a sinking heart. At her current deceleration of two gees, it would take *Amity* an hour and forty-six minutes to reach Uno. The only way to speed up the trip would be to turn the ship, accelerate for a while, then turn her again and decelerate. But turning the ship twice would undoubtedly eat up any time such a maneuver could buy them. Simply upping their deceleration rate wouldn't help; it would slow *Amity* faster but would bring her to a stop short of the planet, away from any shelter.

Unless . . .

He tapped for a position plot. They were in luck: Uno's single moon was almost directly on *Amity*'s heading, and was a good three hundred thousand kilometers closer to them than the planet itself. A slight course change would take *Amity* into the safety of its shadow. "Kennedy," he called, "shift course to the dark side of Uno's moon; compute deceleration and ETA. Marlowe, get me an estimate of B's brightness behind that expanding shell and give the numbers to engineering. I want to know how long the hull will be able to take it."

"Sir, a constant eight-gee deceleration will get us to the moon in twenty-six point eight minutes," Kennedy reported a minute later.

"That's a little tight," Marlowe said. "Even if we rotate slowly to keep the heating uniform the hull will reach the danger point in fifteen to twenty minutes."

"Kennedy?" Roman asked.

"We can cut it to twenty minutes by shutting down the drive and maintaining our present speed for nine minutes, then doing eleven more at twelve gees," she said doubtfully. "That'll barely give us time to take anti-gee drugs, though. And I don't know if the Tampies have anything like that for themselves."

"The first light from B is coming through the shell, Captain," Marlowe said, his voice rigidly controlled but about three notes higher than usual. "Full light in maybe two minutes."

"We've run out of choices, Lieutenant," Roman told Kennedy. "Lay in your course."

As the warning alarm began to hoot, Roman thumbed out a high-gee hypo with one hand and keyed his intercom with the other. The Tampies, Rrin-saa soon informed him, had no drugs of that sort, and had not, in fact, ever undergone accelerations higher than around eight gees. Given the circumstances, though, he said they would risk it.

A moment later the shell broke completely. The hull temperature jumped dramatically, and all sunward sensors cut off or flared into uselessness. Within minutes, despite the rotation Roman had ordered, *Amity*'s outer reflective layer was beginning to show signs of blistering and the temperature within the ship was rising far faster than the cooling system could counteract. By all indications, the race was going to be a toss-up.

And then the fusion drive kicked back in. The last thought to flicker through

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Roman's drug-numbed mind before the blackness overtook him was that putting his ship and crew through this high-pressure volcano was a hell of a way to run a rescue mission.

Slowly, as if in disbelief at her survival, *Amity* began to pull herself together.

"Damage control reports over twenty buckled hull plates and some hairline cracks in the main support beams. Repair crews are working on the worst of it."

"Breakage of improperly stowed gear is pretty high, Captain, but nothing vital seems to be lost. We're cleaning it up."

"The landing was a little rough, but didn't cause any damage to the drive, sir. We're a few kilometers south-east of the center of the moon's dark side. Rotation period is about nine days, so we can stay put for a while."

"Casualties, Captain. The Tampy section reports eight of their number died during deceleration. No deaths on our side, but a number of broken bones and minor injuries. A medical team has gone over to the Tampy side to assist their doctors."

"Damn," Roman muttered. Eight dead—and the fact they were Tampies almost made it worse. Something else on the debit side of the ledger. He would have to call Rrin-saa and give his official condolences, of course; best to do that immediately.

"Captain!" the communications officer called excitedly, interrupting his thoughts. "I've got Dr. Lowry's group now—on five."

Roman stabbed the appropriate button on his intercom. "This is Captain Harl Roman of the *Amity*."

"Dr. Jamen Lowry, Captain. You can't know how happy we are you're here." Lowry's face—what could be seen of it through the pressure suit helmet—looked haggard. And even through the static his voice sounded more dead than happy.

"I'm glad we made it. Where are you?"

"Dark side of the planet. I can give you our latitude and longitude, but that won't help you much; Shadrach—that's our name for the planet—rotates once every fifty hours and we have to keep moving to stay out of the light."

"Yeah." Roman had looked through the viewport at the planet only once. Low in the sky, showing about half a disk, and shining only by light reflected from fairly dark rock, it had still damn near blinded him. "What sort of vehicle do you have? A lander?"

"Yes; a Sinor-Grayback TL-1. We had to abandon a lot of its fuel at the base, and we've used some since, but we've still got enough to meet you in a high orbit whenever you're ready."

"Good. Now, I understand there's a Tampy group down there, too. Are you in contact with them?"

Lowry shook his head. "I'm afraid they're beyond your help, Captain. Their base was on the sunside when the dwarf first flared up. They're all dead."

Oh, hell. "You're sure?"

"Yes. We went to their camp as soon as it had rotated to the dark side. They had no warning whatsoever, no chance to escape. If the flare hadn't blown off Shadrach's minuscule atmosphere and sent shock waves through the ground,

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we'd have been caught off guard ourselves." Lowry's hand reached up, as if to run his fingers through his hair, then dropped in obvious embarrassment. "We don't know why the dwarf triggered so soon; it should have been all right for at least another month. Never mind that now. When can we lift to meet you?"

"As soon as the light intensity goes down enough for us to get across to you. We're presently on your moon's dark side."

Lowry stared. "You're not over Shadrach itself? Captain—" He swallowed and took a deep breath. "Captain, you can't wait that long. Our calculations show that the next flare-up will be the final one."

Roman's mouth suddenly felt dry. "The nova?"

Lowry nodded. "And the dwarf won't go down more than a magnitude or so in brightness before that."

"How long have we got?"

"Sixty to seventy hours."

"All right. We'll see what we can do. I'll be in touch. *Amity* out."

The bridge was very quiet, Roman noticed as he broke the connection. Turning carefully—the twelve-gee run had left an ache in every muscle—he motioned to Second Officer Skald, who was sitting at Chen's usual station. "You heard all that," he said. "I need to know how much more the hull can take."

"Already computed, Captain." Numbers began appearing on Roman's screen. "The drive section could stand another fifteen hours or so without damage," Skald continued. "Unfortunately, we can't go from here to Shadrach's shadow in that position—the steering jets don't generate enough thrust."

Roman hadn't even considered that approach. "Too bad. How about the rest of the hull?"

"In twenty minutes she'd start popping seams," Skald said bluntly.

"Kennedy?"

"No good, sir," she replied, shaking her head. "If I stay below eight gees we can't make it in less than an hour. And any higher acceleration will kill more of the Tampies."

Which reminded him, he had some unpleasant news to break to the aliens. He'd have to squeeze time for that soon. "What about putting extra shielding on the hull?" he asked Skald. "I know we've got some spare drive plates."

"Hmm . . . I doubt if we have enough to do any good, sir, but I'll check." He hesitated, then stood and came to Roman's side. "I suppose, sir," he said in a low voice, "that I should point out that the higher resistance of the drive section means we can head *away* from B anytime we need to. We have more than enough fuel to drive all the way back to our rendezvous with Pegasus."

"That would leave the scientists stranded on Shadrach, of course. Are you suggesting we scrap the mission?"

"Not at this point, sir. But if we can't get to them in thirty-five hours or so, that will have to be my recommendation."

"Consider it noted, Commander."

Skald nodded and returned to his station. Roman watched him go, marveling for the *n*th time at the cryonic mind that lurked behind that smiling Scandinavian exterior. Certainly, the possibility of an

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abort had to be considered; Roman had already done so, to some extent. But Skald had a knack of distilling all of the emotion out of such issues. Superbly competent at his job, he had such a rigidly practical view of life that he sometimes seemed even more alien than the Tampies. Empathy carried to extremes Roman could at least dimly understand; complete lack of it he could not.

Tampies. For a moment Roman stared at his intercom. Then he punched for the alien section. The task could not be put off any longer.

As usual, Rrin-saa answered. "Rromaa?"

"Yes, Rrin-saa. I wanted to offer my condolences on the deaths of eight of your people."

"Eleven. Three more have died of internal injuries. We mourn them."

"Oh, I'm sorry; I didn't know." He took a deep breath. "I'm afraid I have more bad news for you. It appears your research base on the inner planet was completely destroyed by the first great flare."

Rrin-saa gave the Tampy equivalent of a nod. "This is as expected."

"You knew already? How?"

"If the Tamplisstan base had survived there would have been no need for a rescue. They would have transported themselves and the humans alike to safety."

"Oh. Of course." They'd probably known as soon as the distress call came through, Roman realized now. But he hadn't bothered to ask their thoughts on the matter . . . and Tampies seldom volunteered such information. "Again, I'm sorry. I wish things had gone differently."

"As do we. I must leave now. The mourning continues." The screen went dark.

The next hour flew by much too quickly. At least half a dozen ideas were proposed, but none could long stand up to the facts of the situation. There was just too much light, heat, and radiation to contend with. And not enough time.

Skald had just reported that *Amity* had enough spare shielding to add a two-centimeter thickness to the hull —"Handy, if there were mosquitoes out there," as he'd put it—when Marlowe, face glued to his scanner hood, called Roman over.

"Captain, I'm picking up something in orbit around Shadrach," he said, rising from his chair. "I wonder if you'd take a look and tell me if it's what I think it is."

Roman sat down and looked into the hood. Two tiny arrows marked the spot. . . . "Damned if that doesn't look like a space horse," he said.

"That's what I thought," Marlowe nodded. "But what's it doing there? Assuming it's the one the Tampies here were using, why hasn't it Jumped?"

"Maybe there's a live Tampy still handling it," Roman suggested.

"If so, he's being pretty quiet," the communications officer spoke up. "I've been beaming Tampy contact signals at Shadrach since we got here. Just in case some of them had survived."

"Well, there's no point speculating," Roman said. "Let's ask an expert."

"I do not know," Rrin-saa said after Roman had outlined the situation. "However, there is one possibility. The space horse would have been set in sta-

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tionary orbit above the ground observers, with six or fewer Tamplissta as Handlers. When the station was destroyed . . .'' He paused for a moment. ''You must know that we feel more deeply toward life than humans seem to. The sudden, unanticipated deaths of their companions may have caused a reaction in the Handlers; and, through them, in the space horse. You have no corresponding pattern: *catatonia* may be similar, if I understand that term, but its causes are much different.''

So the vaunted Tampy empathy could sometimes be a handicap. ''When will they come out of it?''

Rrin-saa seemed to sigh. ''The Tamplissta will not. If they have not recovered by now they are dead, killed perhaps by the extra radiation. The space horse may still live, though he is most likely still in reaction.''

''Just a second.'' Roman supposed he should feel something for the deaths of a half-dozen more Tampies. But a single crucial fact had grabbed his entire attention. ''You're saying that the space horse out there is *alive?* And that we can go right up to it without spooking it?''

''I did not say such things. I do not know if he is alive.''

''But it *may* be.'' Roman's mind raced furiously. It was their only hope. ''Do you still have any Handlers on board?''

''Most were left with Sso-ngii in the lifeboats.'' Rrin-saa paused. ''Even if the space horse could be made to move, he would not have the strength to pull *Amity* any great distance.''

''It won't need to. If we can get it to come here and then go back to Shadrach, we can fly in its shadow under our own power. We'd need a volunteer Handler or two who would be willing to ride a heavily shielded lifeboat over there and try to communicate with the horse. It would be a dangerous trip, but it's the only way I can see to rescue our people.''

The instant he said it Roman wished he hadn't. *Our* people. The Tampies had no reason to risk their lives for the humans on Shadrach.

Slowly, Rrin-saa gave the Tampy nod. ''Very well. Prepare your lifeboat; I and all others who have any Handler training will go.''

''You?''

''I am the best Handler left on *Amity*. It is my task.''

''I see.'' Roman hesitated, but the question was too strong within him to be suppressed by good sense . . . and if he never asked, he would never find out. ''Rrin-saa, why are you doing this? Why risk your life for aliens? I can't order you to go out there; I'm sure you know that. For that matter, why did any of you come to Shadrach at all? You already knew your own base had been destroyed—you could have all stayed with Pegasus.''

Once again, the Tampy seemed to sigh. ''Do you still not understand us, Rro-maa? Our duty is to all living things; to respect not only them, but also the balances and hierarchies of nature within which they exist. As intelligent, tool-using creatures we have the power to alter these balances, and the corresponding responsibilities are very great. We do not choose this rôle of caretaker, contrary to the statements of some humans. It is, rather, the price we pay for

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the gift of sentience. You humans have a similar responsibility, though you frequently neglect it. But negligence alone does not alter your high position in the hierarchy of life. Whatever our feelings toward your race, it is still our duty at present to guard your safety. The lives of fifty humans are worth great risks." He paused. "And the space horse, too, is of high value. Perhaps he can also be saved. I must go now to prepare." The screen blanked.

Roman stared at the screen for a minute, trying to absorb all the implications of Rrin-saa's words. It was as if he fully expected to die out there and had made one last attempt to explain the Tampy philosophy. The thought made Roman shiver.

"They'd make Saint Francis of Assisi blush, wouldn't they, Captain?" Skald remarked as he left his station and came to Roman's side.

His sarcastic tone broke the mood, like a snicker at a funeral. "You heard what I said about the lifeboat," Roman said, trying to hide his irritation at the other's insensitivity. "Do we have enough spare shielding?"

"Yes, sir, but just barely. Specifically, we can shield only one side of the boat, and even then it'll only be good for a one-way trip. The stuff will boil off too fast."

"Hell. So if the horse out there is dead, this is a suicide trip." If he couldn't order a Tampy to take risks like that, he certainly couldn't order a human pilot to do so.

Skald might have been reading his mind. "No need to call for volunteers, sir. I'll fly the Tampies myself."

"You? Why?"

"I'm probably the only one aboard who's had tugboat experience—all the extra shielding mass will throw the boat's center of mass way off, making it very tricky to fly. And the approach *has* to be made on manual."

Roman nodded. Autopilot approaches often made space horses skittish. Either they could sense the absence of a living pilot or else the extra sensors needed by the computer bothered the animals—no one knew for sure. Roman didn't know if a catatonic horse would also behave that way, but they couldn't afford to risk it. "So you think it'll be like running a tug?"

"Similar, at least. But I think it's our best chance."

"All right. Get busy on your preparations. I'll get someone else to supervise work on the boat."

"Thank you, sir."

The two men returned to their tasks, and only later did it occur to Roman that Skald's bravery might have been alloyed with a bit of paranoia. After all, Rrin-saa *had* spoken of saving the space horse. What better way to save it than to let it Jump?

"Contact in one minute," Marlowe announced, and Roman shifted his attention from the hull repair work to the lifeboat monitors. There was little to see; Skald was coming in on the horse's dark side, and the low-level lighting he was using disappeared into the creature's energy-absorbent surface without a glimmer. Only the thin strands of the Tampy harness were visible.

"I'm approaching a rein line," Skald's voice murmured, just audible above the static. "Rrin-saa and a couple of the

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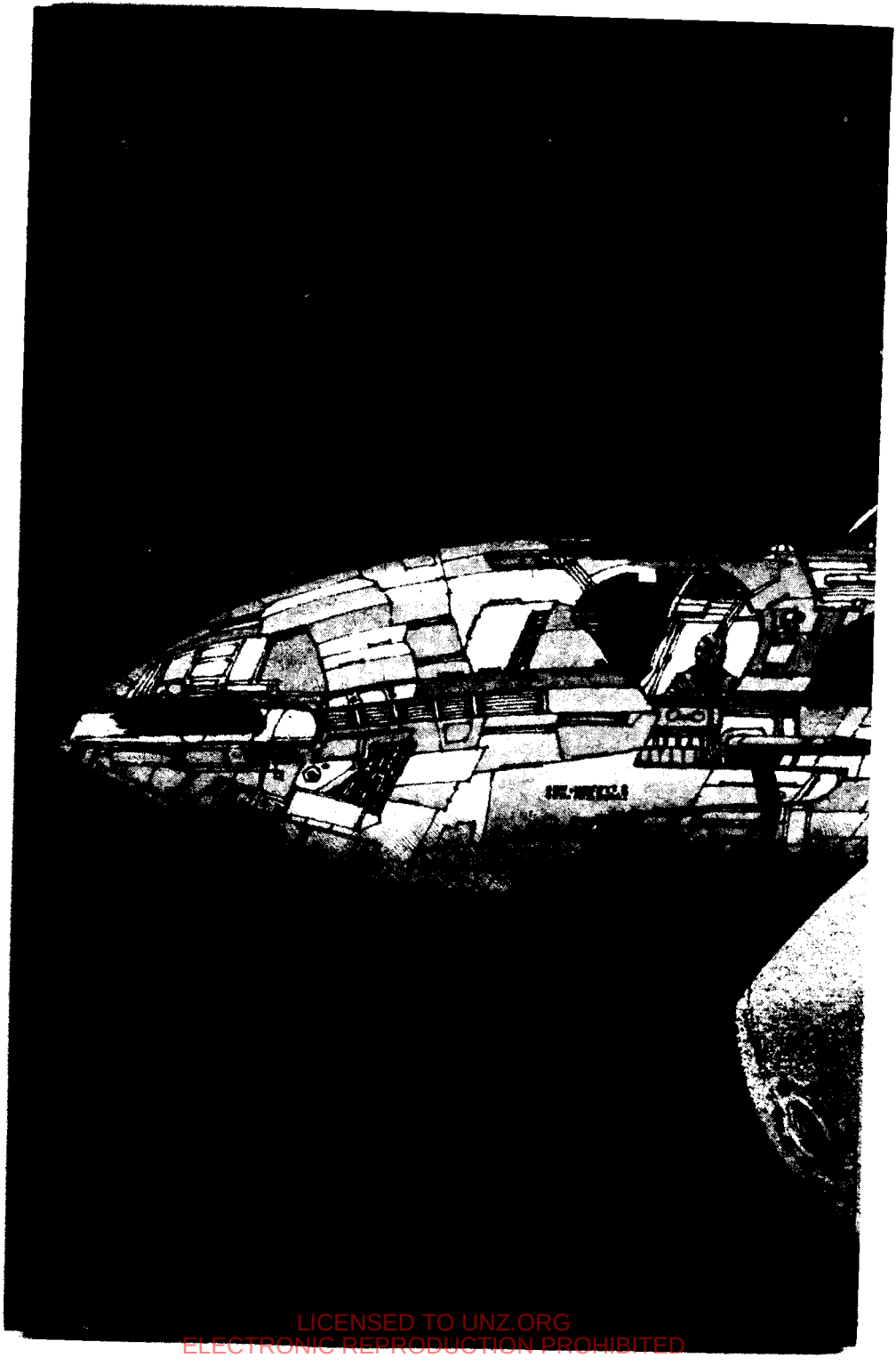

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others have gone into their trance or whatever. Two of the others are waiting to link me up to the rein. Still no way to tell if it's alive or not."

The next few seconds were interminable. Roman's fists tightened into lumpy knots as he stared at the screen, watching the harness for signs of movement. The horse *had* to be alive, he told himself again and again. The most popular human and Tampy theories suggested that the creatures had evolved in the energy-rich accretion disk of a large black hole; surely this one could survive a few days in B's enhanced sunlight. But the logic sounded too much like wishful thinking. He could feel the sweat collecting under his collar as he went through the agonizing, semi-masochistic ritual of trying to think of something else he could have done, something that wouldn't have sent those aboard the lifeboat to almost certain death.

Without warning, the space horse twitched violently, taking Roman's heart with it. The picture from the lifeboat settled down as Skald matched the motion. "I think they've made contact," the pilot commented dryly.

"He is alive, but is very weak," Rrin-saa's voice cut in. "He has suffered badly from the extra radiation."

"Can it make a round-trip flight out here?" Roman asked.

"I do not know. It may kill him." The Tampy paused. "We will try."

"Captain, the space horse is moving," Marlowe announced a minute later.

"We're on our way," Skald confirmed. "ETA—oh, at least ten hours at this rate."

"Acknowledged. Good job, all of you. Keep us informed."

Roman cut himself out of the circuit and punched for a status readout. Yes; even with the repair crews short by the number of men who'd stayed with Pegasus, work was proceeding reasonably quickly. *Amity* would at least be able to fly by the time the horse arrived. Turning to the communications officer, he said, "Send our current status to Commander Chen; tell him to assume a rendezvous time of about fifty hours from now. I take it we haven't received any word from them?"

"No, sir," the officer said, "but that's not unexpected. There was no room for a really high-power comm laser on the lifeboats, and it's doubtful that the one they have could punch a signal through the extra particle radiation coming from B."

Roman nodded and shifted his attention back to the lifeboat monitor. Rrin-saa's suggestion that the radiation was killing the space horse was ominous. Pegasus was getting a high dosage, too, and how the radiation was affecting it was something they had no way of knowing. If whatever sickness Pegasus already had was made worse by the conditions here—

He shook off the thought. Pegasus *had* to survive; that was all there was to it. Otherwise there was no escape for any of them.

Twelve hours later the space horse dipped briefly into the shadow of Shadrach's moon, keeping well away from the body itself. *Amity* was waiting, and together they headed back into the deadly passage.

"How's the space horse doing?"

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Roman asked the lifeboat when they were underway.

"His condition is worsening," Rrin-saa replied. The Tampy's voice was flat and his eyes seemed curiously glazed. "I do not know if he will survive the trip."

"Skald?"

"I have to agree, Captain. We started with an acceleration of point-one gee; our deceleration at rendezvous was three-quarters that, and our current acceleration is even worse. We'll be lucky to reach Shadrach in eighteen hours."

Roman looked up from the screen. "Marlowe, what's it like out there?"

"Light and radiation are decreasing, but it's still way too hot for us. The hull plates would last maybe an hour or two."

"That's it, then," Roman told Skald. "We stay with the horse as long as possible and keep our fingers crossed. That's still our only option, I'm afraid."

"Yes, sir. I suggest, Captain, that you alert Dr. Lowry's group and feed them a continually updated ETA, so they'll be ready to rendezvous whenever we're in position."

"We're already doing so. Keep me informed on the horse's condition."

Skald was right: the space horse was definitely losing strength. Usually a horse in normal space would travel at a constant acceleration or deceleration, but there were long periods now when theirs simply drifted, allowing itself to be pulled by Shadrach's gravity. Swearing quietly to himself, Roman spent the next few hours alternately updating Lowry, encouraging Skald and Rrin-saa, monitoring the repairs still in progress, and nagging the astrophysicists for new estimates on B's next flare-up. He received little encouragement from any of it.

Finally, with Shadrach's disk filling the viewscreens, the space horse gave up.

"I'm sure it's dead, Captain," Skald said, his face grim and tightly controlled. "It hasn't done anything but fall planetward for the past twenty minutes, and the Tampies . . . well, they don't look right, somehow."

"Rrin-saa?" Roman called. "What's happening?"

"He is dead." Rrin-saa's voice was very alien; dry and brittle in a way that Roman had never heard it. And yet, there was an infinite sadness to the tone that hit Roman like an unexpected chill.

"Skald," he said, when he found his voice again, "cut loose from the space horse and jettison any shielding you have left. Vaporize the rein line if you have to. Then flank-speed it back here. We'll stay in the horse's shadow until you're aboard." Tapping some keys, he checked their course. The horse would enter Shadrach's shadow as it fell to the planet, but not at the height that Roman had wanted. *Amity*'s fuel supply was not infinite, and if they went too far into the gravity well they might not be able to get back out.

Erin Kennedy had apparently had the same thought. "We'll come in too low if we stay with the space horse, sir," she spoke up.

"I know. Plot a course to take us to our scheduled rendezvous point. We'll head out as soon as the boat is back. Inform Dr. Lowry that this is it."

The acceleration alarms went off, and moments later Kennedy's course ap-

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peared on Roman's screen. It would, he observed uneasily, take them into direct sunlight for just under ten minutes. The hull could take that, of course, but he had wanted to save it as much damage as possible on this leg of the trip. It was still a long way back to Pegasus.

The rendezvous, three hours later, was almost an anticlimax. Securely planted in a stable orbit, *Amity* waited as the dagger of blue flame that marked Lowry's lander rose to meet her. Roman had had some worry that the smaller craft wouldn't be able to match *Amity*'s horizontal velocity and would crash violently into the forward hangar at bulkhead-smashing speed. But Lowry's pilot had planned correctly, spending the last of his fuel in a burst of acceleration as *Amity* swept down on him. The meeting was accompanied by a great deal of noise and a considerable jolt, but nothing vital was broken.

"Welcome aboard, Dr. Lowry; gentlemen," Roman called to the hangar via intercom. "You'll be shown to hammocks; get in them immediately. Acceleration in five minutes." He switched off without waiting for a reply and turned to Kennedy. "Are you set?"

"Yes, sir. We break orbit and drive straight away from Shadrach, staying in its umbra as long as we can. Then we blast laterally to get back to Pegasus. That gives B more time to cool down and it puts us farther out before the hull gets any sunlight. As it is, we'll still have to periodically shut off the drive and rotate sternward to B to let the hull cool off."

Roman nodded. "Particle radiation still decreasing out there?"

"Yes, sir," Marlowe answered.

"And still no word from Chen." It wasn't a question.

"He may still be having trouble with transmission," Kennedy offered after a pause. "It may not mean anything's wrong."

"Well, we'll know soon enough," Roman said grimly. The look on Chen's face when he'd learned he was to stay with the Tampies floated to the surface of Roman's mind; almost brutally, he forced the image back. "Sound your warnings, Kennedy, and let's get the hell out of here."

"Engine room reports they're shutting down the drive in one minute, as per orders, Captain," Kennedy reported.

Roman acknowledged with a nod. That would leave *Amity* with just enough fuel to match speeds with Pegasus and the lifeboats. If they ever found them.

"Still no word?" Roman hated the question the instant it was out of his mouth. Obviously, there was no word, or the communications officer would have reported it. Repeating the question so often served only to make Roman look worried. Which he was.

"Nothing yet, sir."

"We're approaching their computed position," Kennedy said. "If they're there we should be picking them up soon."

"Captain, I've got them!" the communications officer all but shouted. "They're using radio instead of the comm laser."

Roman stabbed his intercom. "Chen?"

"Chen here, Captain." The voice

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sounded almost as relieved as Roman felt. "Sorry we couldn't report sooner; we had some trouble with the laser."

"Never mind that now. Are you all right? How's Pegasus?"

"We're fine, and so is Pegasus. As far as we know."

Marlowe cut in before Roman could ask what that meant. "Captain, I've got them visually now . . . but there's something wrong. If the range is correct, the size I'm getting is all off. It looks—sir, it looks like Pegasus has *shrunk*."

"Not exactly, Marlowe." Chen chuckled. It had been a long time since anything cheerful had been heard on the bridge, and several heads turned at the sound. "Captain, I'd like you and the *Amity* to meet *Junior*."

"I still can't believe it," Roman said.

Beside him, Chen smiled. Despite several days of weightlessness, he showed no signs of discomfort in the one-point-five gees at which Junior was hauling them out of the system. "I don't believe it either, skipper, and I watched it happen."

"I hope you got it on film."

"My father would never forgive me if I hadn't. Yes, we got most of it. We were watching Pegasus pretty closely by the time the bulge appeared, trying to figure out whether or not we should take the webbing off like the Tampies wanted."

"Why'd you delay so long? I understand you cut it a bit close."

Chen shrugged uncomfortably, his smile fading. "We didn't trust them," he said bluntly. "The Tampies told us Pegasus would probably die if we didn't turn it loose, but they wouldn't—couldn't—tell us *why*. I didn't want to risk losing our only ticket out of here on something as flimsy as Tampy empathy; and some of the others were even worse, figuring the Tampies were going for mass suicide or something. It wasn't until the bulge appeared and the Tampies finally realized that Pegasus was trying to calve that taking the web off began to make sense."

"Did the rest of the men share that opinion?"

"Enough did to make it safe for me to give the order. But when Pegasus Jumped before we could get the web back on and we thought Junior would follow—" He actually shuddered. "Chief Kuprin set some kind of speed record getting Junior webbed. When Sso-ngii and Hhom-jee told him afterwards that space horse calves can't Jump until they're a couple of days old, I thought he would strangle them."

"Good thing he didn't. We've lost enough Tampies for one trip."

"Yes, sir." Chen cleared his throat. "I've been thinking, Captain, about the crew questionnaire. It seems to me that the Tampies really went all-out on this rescue effort, and I was wondering whether redoing the survey might not show a more . . . tolerant . . . attitude toward them."

Roman swiveled in his chair to face the other. "Any particular reason why you might think that?"

"Oh, you know—people tend to forget their differences in a crisis," Chen said with a slight shrug.

Roman had hoped for a more personal reason. "All right, go ahead. The other

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survey was the official one, but we can tack on yours as an addendum."

"Thank you, sir. I'll have the results in the computer by the time we reach Solomon."

The *Amity* reached Solomon ten hours later, and the results of the second poll were indeed in. And Lee Chen was livid.

"Damn it, damn it," he kept muttering under his breath as he strode along the velgrip in Roman's quarters. He looked very much like a man who wanted to stamp loudly, but that was impossible to do in free fall.

"Simmer down, Lee," Roman told him, handing him a zeegee glass. "What were you expecting?"

"Intelligence. Or failing that, gratitude." He took the glass, but instead of drinking slammed it down on a velgrip patch. "But look at it—a lousy one-point-six percent gain. Hardly even worth mentioning." He waved angrily at the survey results displayed on Roman's screen.

"Intelligence? You said it yourself once—the reaction to the Tampies is a gut-level one. It's not going to be changed by any single example of Tampy courage or cooperation. You, of all people, should realize that."

Chen stopped his pacing. "What do you mean?" he asked, frowning at Roman.

"I mean that one of the two people who changed sides on this survey was you," Roman said bluntly. "And you did so even though your feelings toward the Tampies really haven't changed."

For a moment Chen stared at him. Then, dropping his eyes, he picked up his zeegee glass. "I thought the responses were supposed to be confidential," he said in a more subdued tone.

"Technically, they are. But the responses are tied to the appropriate personality profile for later study. Yours wasn't hard to identify."

"I'm that distinctive, huh?"

"Yes. I get the feeling you were the fee the anti-Tampy faction charged to support this flight. Were you supposed to stir up feeling against the Tampies aboard the *Amity?*"

Chen grimaced. "Probably," he growled. "No one was stupid enough to suggest it openly to me, but it's probably what they expected. But I tried to be as open-minded as I could."

"So why did you change your vote? Just as a mark of gratitude for the Tampies' help?"

The other nodded once, but then shook his head in frustration. "I've tried, skipper, I've really *tried* to like them. I know there are lots of reasons why I should. But my gut just won't catch up to my brain." He rolled his glass gently between his hands, staring down at it. "You probably don't know that my family was among those the government ordered off Mangrove after the Tampies made their big stink. I was twelve when it happened. Three years of hard work—gone in a single day. It hit my folks pretty hard. I hated the Tampies for a long time after that."

"Changing your feelings is always a slow process," Roman said after a moment. "Give them time."

Chen snorted. "Time is about the last thing we have. *You're* the one that said we were on the brink of war—remember?"

"Yes," Roman acknowledged, "and

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a week ago we were. But not any more."

Chen looked up at him, eyes sharp with both interest and suspicion. "What are you talking about? Nothing's been changed."

"On the contrary." Roman nodded toward the viewport.

The other glanced in that direction. "Junior? —oh."

"Of course. Think of it, Lee. The Tampies have been trying to get space horses to breed in captivity for close to six hundred years. And it's finally happened—on the first human-Tampy cooperative starflight."

"But what caused it? Pegasus didn't calve just because there were humans on the *Amity*."

"Probably not, although that's not impossible," Roman shrugged. "Even the Tampies don't know everything about space horse senses and moods. Why *shouldn't* one like having a mixed group of us nearby? But it's probably something more mundane: our webbing material, the radiations from our fusion plant, or maybe something related to the nova."

"But if that's the case," Chen said slowly, "then the Tampies will still eventually end up not needing us for anything. They'll be able to duplicate the conditions themselves."

"Granted—eventually. But *until* then the case for cooperation is pretty near overpowering. Consider what a successful space horse breeding program would mean to both races—I say *both* because our government will certainly insist on rental rights if we're helping in the project. The very first effect will be to ease the pressure on the border

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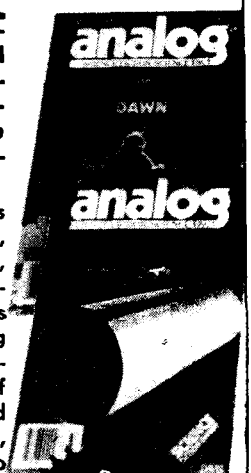

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region as both of us gain the capability to expand more easily in other directions. That means new worlds will be opened up to the miners and developers—worlds we otherwise couldn't have efficiently done anything with."

Chen shook his head impatiently. "These are all just economic arguments. Public feeling is still running high against the Tampies."

"And that's where you're missing my point—because feelings and prejudices usually don't cause anything bigger than fistfights. It's *economic* forces that start and stop wars. If the business interests decide peace is their best option, then we'll have peace. Grudging peace, maybe, through a new generation or two, but we can survive that."

"Are you saying public opinion doesn't matter at *all?*"

"It's worse than that, even—public opinion is more like a tool that's manipulated to justify whatever course of action the economics dictate."

"That's a pretty cynical view of the universe," Chen growled.

"I didn't say I liked it," Roman admitted. "I don't. But it seems to be the way human society works, and refusing to accept that fact doesn't make you immune to the pressure; it just keeps you from using it. On the other hand, by knowing it's the economic forces that draw people together, I know how best to place my emphasis in my final report."

"So what you're saying is that this big fat idealistic mission to foster brotherhood and trust is going to wind up fostering profits instead." Chen looked like he had a bad taste in his mouth. "And that I've been wasting my time trying to like the Tampies, because someone's going to make me like them now whether I want to or not."

Roman shrugged. "Peace is often built on money. But so what, as long as it's built *somewhere?* And it doesn't negate the existence and usefulness of the higher virtues. I expect we'll learn a lot about practical idealism from the Tampies in the coming years—from talking to Rrin-saa I strongly suspect that the opportunity to teach us such things will figure strongly into *their* profit motive."

"Well . . ." Chen still looked unhappy.

"Come on, cheer up and look at the bright side. We got out of Shadrach's system with our skin intact, we either slowed down a potential war or else stopped it in its tracks—and you've got a brand-new story for the Chen family archives." Picking up his glass, Roman touched it to Chen's. "A toast: to peace and friendship among all peoples."

For a moment Chen continued to glower. Then, with a lopsided grin, he raised his glass. "And failing that, to greed."

They drank. ■

● One machine can do the work of fifty ordinary men. No machine can do the work of one extraordinary man.

Elbert Hubbard

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Dr. Mark S. Lesney

Stocking The Galley Of Spaceship Earth

Cloning, breeding the super-race, expansion into hostile new environments with colonists genetically engineered to survive, constant vigilance against alien species that seek to conquer and destroy—these are the day-to-day realities of the food technologists of Spaceship Earth. Food is the ultimate energy source, without which all others are as luxuries to a corpse. And yet the food stores are dwindling in the galley holds, as over 200,000 new passengers crowd on board each day and the demand for grain alone increases by 25 million tons each year.

Resources are directed, wisely or not, into other sectors of the running of the ship, as there are growing signs of mutiny among the crew and rioting among the passengers. The Captain angrily complains that he has more important things to worry about than stocking the galley when several staterooms are on fire and the reactors need more fuel.

The Captain throws charts and learned reports at the kitchen representative that claim there is more than enough food available to feed the present population of Spaceship Earth. With proper management, even without new scientific breakthroughs, populations double to quadruple the present-day ones could be tolerated. (Some perhaps overly optimistic researchers claim that up to 45 billion passengers could be supported in the future).

What the Captain overlooks in citing such glowing projections is that they all assume competency, organization and cooperation, and even a degree of philanthropy on the part of bridge personnel. But Spaceship Earth is not well organized, is not intelligently run; and certainly humanitarians are not issuing the orders. Massive political and economic reorganization on a ship-wide scale would be required for the theoretically possible dream of food for all to become a reality.

As detailed by Harry Walters, economist at the World Bank: Although food supplies in developing countries will fall between 55 to 85 million tons short by 1985, the potential surplus in developed countries would be more than enough to make up for the deficit. However: "the transfer of much of this surplus to deficit poor countries would have to take place on concessional terms, which seems neither desirable nor likely."

The necessary agricultural, political, and economic reforms to try and prevent the famines that otherwise seem inevitable are being advocated by many widely ranging voices, from grass roots, activist-oriented organizations such as

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the Institute for Food and Development Policy to more "hard-core" scientific voices such as that of Dr. Norman Borlaug, winner of the Nobel Peace Prize in 1970 for his role as the foster-father of the so-called "green revolution." (Prior to the fuel crisis in the early '70s, the green revolution had provided strong hope for food self-sufficiency throughout the developing world via the use of new plant varieties coupled to high-technology input.)

But the outlook for transnational cooperation and wide scale change in the world economic order seems to remain, at least for now, a utopian dream. In short, the kitchen staff can expect no help from the bridge for the present. Screaming over the intercom is a necessary action; someone in charge might hear and do something sensible. But the bridge can't be trusted for "needed-now" solutions.

Agricultural science is trapped in this framework and must opt for pragmatic approaches that treat with what *is*, and not with what should be. Like the old horse in George Orwell's *Animal Farm*, the only option for the food technologist in a world out of intelligent control is to say: "I will work harder," and to do so.

The passengers and crew are clamoring for food, and pointing a blaming finger at the bridge won't fill their stomachs. They have to be somehow satisfied, and under the circumstances miracles are needed. With population growth unchecked and world systems as they are, all measures are stopgap indeed. But without such measures catastrophe already would have arrived.

Such is the present and future plight of agricultural science in a chaotic world.

At the turn of the century in the U.S., one farmer's production fed four people. Today the ratio is one farmer feeding fifty. Since 1940 the actual amount of food produced in the U.S. has increased more than fifty percent overall and, for some crops, such as corn, the yield has more than doubled. This phenomenal result is due almost solely to scientific input into the age-old task of growing food. Heavy, energy-intensive, chemical-assisted, vigorous land use, and highly mechanized techniques have been developed over these past decades. These high-input methods, coupled to biological research and development of the plants themselves, have been the source of the "miracle" of modern agriculture.

But on a global scale there has been a massive destruction of resources through these high-technology procedures, which sacrifice several bushels of topsoil to wind and water erosion for every bushel of corn produced, that poison land and water (with irrigation, fertilizers, and pesticides), and promote the encroachment of desert everywhere.

More input becomes required for less gain as fuel, fertilizer, and equipment become scarce or too expensive. The economics are such that high-input technologies, even if they remain workable in the developed nations, will not be adaptable to the necessary, planet-wide scale. Lack of resources will bar the way. The best estimates suggest that feeding the entire world with a U.S.-type system would require at least 80

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percent of the world's total annual energy output to be diverted solely to food production. And that's with today's population.

It is no wonder then, that here within one of the most ancient human technologies—that of food production—the greatest breakthroughs of the new biological revolution are being sought and achieved. There are too many mouths to feed, and drastic new approaches are needed to supplement the old: because costs around the world are outstripping not demand, but the ability to pay. Breakthroughs in the biology of the crop plants themselves promise a cheaper and more universally adaptable worldwide framework for future agricultural growth.

Food production is in essence a symbiotic relationship between man and plant for the benefit of both. Step by evolutionary step, man and his chosen food partners have moved inexorably to a precarious position of artificiality which has, up to now, allowed each to prosper to an almost unimaginable degree—over 4 billion human beings matched with close to 1400 million metric tons (per year) of cereal grains alone.

By the very nature of the system, there are only two approaches possible to food technologists of Spaceship Earth for the improvement of the symbiosis.

These same approaches apply from the poorest subsistence farmer in Bangladesh to the corporate giants of American agribusiness. For plants, as for people: Environment + Heredity = Yield.

From pulling out a weed by hand or squashing a single leaf-chewing caterpillar between two fingers in the Babylonian fertile crescent four thousand years ago, to the use of multiton tractors and thousand-acre crop-dusting planes in Iowa today, man has manipulated the environment so that his plant partners might thrive.

And from simply replanting the best-growing, best-tasting varieties over the hundreds of generations of man, to the laboratory manipulation of isolated plant cells and genes today, man has altered the heredity, the very nature of his plant partners, in ways more dramatic than the progression from ape to *Homo sapiens*. Almost all of the most important crops grown today have been altered more by human than by natural selection.

Without this continual, two-fold evolution of environmental and genetic manipulation of plants throughout history, there would have been no civilization, no cities, no possible increase in population or lifestyle beyond that of scattered, foraging tribes, because there would have been no food to fill the galley holds.

But the very precariousness described as the present-day situation of agriculture on Spaceship Earth resides in this: that a well-run, highly mechanized farm in the Midwest is nearly as artificial an environment as a city on the Moon; and its common vegetable inhabitants are about as suited to survival without their tremendous environmental support systems as an astronaut marooned on Mars.

Even the most primitive subsistence farm using no chemicals and nothing but human labor is far from being a model of a natural, self-sufficient ecology.

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When these highly artificial systems (necessary as they are) slip out of balance, catastrophe and near-catastrophe occur.

One of the chief threats to balanced plant production is disease. Throughout history plant disease has thrown even the most carefully manipulated environments and heredities into chaos.

Infectious plant diseases are caused by microorganisms (such as bacteria and fungi) and viruses. Just as humans get sick, so do plants. Just as humans differ in their hereditary resistance or susceptibility to disease, so do plants—except that plants, having no white-blood-cell-mediated immune system, cannot be vaccinated against their diseases. Born susceptible, they remain susceptible to a particular strain of disease throughout their lifetimes.

Human history is a patchwork quilt of plant disease-caused disturbances and tragedies.

Throughout the Middle Ages and beyond, ergot of rye in Europe was a constant scourge that destroyed thousands of lives. Ergot is a fungus-caused disease which results in the rye kernels being completely replaced in the fruiting stalks with hard black masses of fungal tissue (called sclerotia) which contain deadly alkaloid poisons and compounds similar to LSD. When an infested field was harvested, sclerotia mixed in with the normal rye grains. Pounded into flour, the mix ended as loaves of poisoned bread. Whole villages—men, women and children—were afflicted with ergot-caused gangrene, hallucinations, and convulsions leading to madness and death. Today the disease is controlled by inspection of fields, use of resistant varieties, and planting only of non-infested seed.

Late Blight, a fungus-caused disease of potatoes, led to the complete destruction of the Irish potato crop in 1845 and 1846. Because of it over one million people died of starvation and from hunger-related diseases. One-and-a-half million more were forced to emigrate (most to the U.S.) in order to survive. The disease occurred simultaneously in a massive epidemic throughout Europe and the United States, but its effects were most devastating in Ireland primarily because potatoes formed essentially the entire basis of the food supply. Today some of the historic animosity of some segments of the Irish population for the English can be traced to the anger roused by the British response (or rather the lack of it) to Ireland's desperate need.

This same disease in 1917 destroyed fully a third of the potato crop in Germany, leading to a serious food shortage that is thought to have hastened the end of World War I.

For a less harrowing example of the agricultural and social imbalance caused by plant disease in human history, one can look at the coffee bean.

Up until 1870 the British colony of Ceylon (present-day Sri Lanka) was unequalled in coffee production throughout the world. But growing huge plantations of coffee trees provided the perfect uniform environment for the spread of the fungus-caused Coffee Rust disease. The disease wiped out coffee production throughout the British colony within a few years and the industry

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died out, yielding to the growers of South America. To offset complete economic devastation, Ceylon switched over to tea bush plantations. And, as a patriotic gesture of support for its colony, England encouraged tea-drinking among its citizens. This is one of the predominant causes cited for Britain's tea-drinking fetish.

This same disease, present now but localized to limited areas in the New World by strict quarantines and controls, has surfaced in a new and sinister light. For the first time in documented history a plant disease has been used as an instrument of biological warfare: a terrorist tool. In 1981 crop-dusting planes in Guatemala distributed a deadly litter of rust-infected leaves over selected coffee plantations. It was a guerilla attack against certain wealthy landowners—an attempt to disrupt the economy and destabilize the ruling right-wing regime. Whatever the politics involved, the implications of such a new twist in terrorist activity are frightening. It is an external threat to which modern agriculture is particularly susceptible. Whole crops can now be held hostage by a few.

In all of these above-listed cases throughout history, man's dependence on agriculture has led to greater and greater vulnerability as his need for plant products grows.

Closer to home, Southern Corn Leaf Blight struck the United States in 1970. Vast acreages of corn were leveled by this fungus-caused disease, and it alone accounted for the destruction of 15 to 20 percent of the entire crop in this country and parts of Canada.

The unique feature of this particular disease outbreak was that it served as a grim reminder of the naturally incurred (not terrorist-induced) risks that modern agriculture is forced to accept in its search for ever-increasing yields. For the epidemic occurred as a direct result of a massive, finely coordinated genetic modification scheme carried out on American corn to decrease production costs and improve yields.

Corn is a monoecious (hermaphroditic) plant and is self-fertile. Each kernel in a corn cob is a seed produced by the union of male and female sex cells, both of which can come from the same plant. This ability of corn to fertilize itself and its neighbors in a farmer's field, producing large numbers of edible seed, is one of the many characteristics which makes it such a beneficial crop.

Corn, like many other plants, shows what is known as "hybrid vigor." This means that the best seed a farmer can plant is hybrid seed (the product of the union of male and female sex cells from two different, specially chosen genetic varieties). Plants from such hybrid seed show greater vigor in terms of growing characteristics and yield and are much superior generally to those from seed produced by the union of male and female sex cells from the same plant or the same variety.

The largest cost in the production of hybrid seed has been the need for the extensive use of manual labor to detassel (remove the male portions of) the "mother" variety. This must be done before the plant can fertilize itself or other nearby "mother" plants (as would normally happen in a farmer's field where food production and not special

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seed stock is the goal). Once detasseling is completed, only pollen (the male sex cells) from the chosen "father" variety will have a chance to fertilize the "mother" plants which will then reproduce the superior, hybrid seed that farmers buy for planting.

But geneticists found a way to eliminate this major bottle-neck in hybrid seed production. Through careful selective breeding they developed lines of "mother" variety corn that contained the *Tms* (*T*exas *m*ale *s*terile) gene. This gene conferred the characteristic of pollen sterility; thus those corn plants that had this gene could only act as females.

A "father" variety could be planted in close proximity to these all-female plants and its pollen would have no unwanted competition. Cheap and plentiful hybrid seed was guaranteed without the involvement of the time-consuming hand labor to detassel the "mother" plants.

But one major problem remained: If a farmer bought this seed and planted his whole field with the new hybrid variety it would all contain the *Tms* gene and be unable to fertilize itself to produce corn seed for food and feed sale. All the plants would be male-less females. Somehow the self-fertility (hermaphrodite nature) had to be returned to the new hybrid seed corn before it could be used.

This was done by the ingenious method of developing "father" varieties for the initial production of the hybrid seed that contained a "fertility-restorer gene" that overcame the effects of the *Tms*-induced male sterility inherited from the "mother" plant. The hybrid seed was thus cured of its genetic male sterility, and plants from it were born as fully functional hermaphrodites with normal pollen. At the same time all the benefits of hybrid vigor were retained.

Acre upon acre, state upon state were planted with the new, cheap, and high-yielding hybrid corn varieties containing the *Tms*/fertility-restorer gene system. It was a labor and energy-saving manipulation of heredity: just the sort of success that agriculture must achieve if it is to continue to feed the swelling population of the world in its present economic state and with resources in ever-decreasing supply.

But then the unpredictable occurred. A new disease appeared in the world. A weakly parasitic fungus, never before a significant problem to corn production, became suddenly of prime importance. It proved capable of producing a plant-killing toxin that affected only corn plants carrying the *Tms* gene. And an incredible amount of corn had been planted carrying the *Tms* gene.

In the space of a single growing season the brand new disease, called Southern Corn Leaf Blight, became the chief killer of corn. No one could have predicted it, and no one did. More than a billion-dollar loss resulted; many farmers were driven bankrupt; the price of meat (since corn serves as animal feed) skyrocketed.

It was a miracle gone sour. Today male sterility is still used, but it has to be a different kind than that carried by the *Tms* gene. Research came up with a suitable replacement.

The incident of Southern Corn Leaf

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Blight and the *Tms* gene is thus a grim warning. It happened before; it could happen again. And yet, breeding for new and valuable agricultural characteristics and the widescale introduction and use of limited but superior varieties is one of the most critical and irreplaceable techniques available in the uphill battle to maximize food production at minimal costs: promise and peril all rolled up into one.

The planting of a single crop (such as *Tms* corn) of a genetically uniform variety is called monoculture. It provides the interface where the two components of the yield equation (heredity and environment) can be manipulated together and to greatest advantage.

Genetic uniformity of height, harvest date, nutritional and water requirements, disease resistance, etc. results from using the monoculture method. Neatly ranked arrays of near-clones allow every section of a field to be treated in the same way: which is the first necessity for mechanization. And mechanization of irrigation, fertilizer and pesticide application, and finally harvesting is what has led to maximal yields with minimal labor.

Monoculture methods have been developed for plantation production of coffee, bananas, cocoa, and tea; they allow for thousand-acre farms of corn, wheat, and other cereals; vast fields of lettuce, potatoes, and sugar beets; huge orchards—the massive scale that agriculture needs to meet the requirements of Spaceship Earth.

But monoculture, as has been shown historically, also allows for the rapid and catastrophic spread of plant disease. It is like putting all the eggs in one basket; but it's the only basket available if the human race is to survive.

And it is because of these great potentials of monoculture that the techniques of genetic engineering, plant cloning, and cell culture become so valuable.

The average passenger on Spaceship Earth is not diabetic, does not have a genetic blood disorder, and will never have the need or opportunity to be cloned. The newspaper thrills and chills predicted from the new genetic technology will probably not be important to his daily life for a very long time, if ever. But every passenger on this planet does eat and does compete with the rest of humanity for ever-shrinking food supplies in a chaotic world economy. For him the genetic marvels in agriculture are the ones most likely to come nearest the heart (or at least the stomach). It is here that the need and the promise of the future are greatest.

In very recent years, the malleability of plants to laboratory manipulation on all levels has blossomed to an almost miraculous extent: a "brave new world" of vegetables is here.

Take cloning, for example. What is a true clone? A clone is a virtually identical genetic copy of an individual organism formed by snipping off a hunk of tissue and regenerating it into a new individual as identical to the "parent" as a twin would be. On this strict definitional level, plant cloning is a time-honored and universally used technique in the laboratory and in agriculture.

Almost every store-bought African violet, chrysanthemum, rose or orchid,

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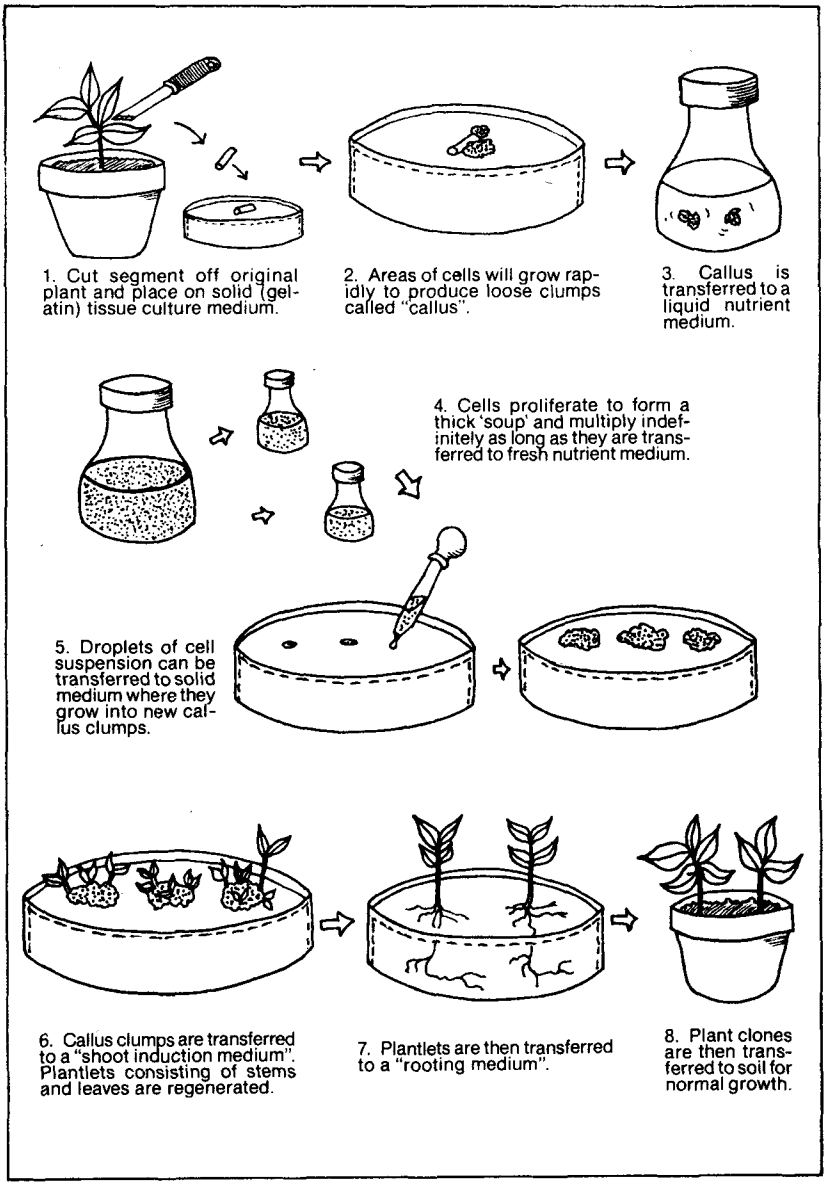
1. Cut segment off original plant and place on solid (gelatin) tissue culture medium.
2. Areas of cells will grow rapidly to produce loose clumps called "callus".
3. Callus is transferred to a liquid nutrient medium.
4. Cells proliferate to form a thick 'soup' and multiply indefinitely as long as they are transferred to fresh nutrient medium.
5. Droplets of cell suspension can be transferred to solid medium where they grow into new callus clumps.
6. Callus clumps are transferred to a "shoot induction medium". Plantlets consisting of stems and leaves are regenerated.
7. Plantlets are then transferred to a "rooting medium".
8. Plant clones are then transferred to soil for normal growth.

Figure 1: Plant, tissue, culture and cloning.

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practically every fruit (apples, oranges, grapes, bananas, blueberries) and many of our important vegetables (potatoes, yams, asparagus) are all clones. Each of them can be traced back to a single source plant that had been carefully bred to have the desired characteristics for that particular flower or crop. The technique used to propagate these initial source plants is pre-historic: it can be demonstrated as a first-grade science project. (Chop a fresh sweet potato in half, stick its cut surface into water, and fairly soon it will root and sprout and be on its way to producing another "self"—a clone of the original.)

So cloning is old hat on the farm. But in the laboratory it has been taken one step farther with incredible results.

All living things are made up of the unit building block called the cell. Bacteria and amoeba consist of single cells; a human being is made up of billions of cells, all of microscopic size. Each living cell in a multicellular organism such as man (or an avocado tree) contains a genetic blueprint for reconstructing the entire organism. Structural differences between cells are due to the use of different portions of the same genetic blueprint in different portions of the body, but each cell contains a more or less perfect copy of the complete set of plans.

Today laboratory technology for plants has reached the point where these single cells can be liberated from the constraints of maintaining an organism complete with roots and stems and leaves. These cells can exist as a living soup with the consistency of watered-down applesauce in a nutrient broth as free-living "organisms" growing and dividing on their own, as long as they are properly fed and given room. This is part of the science of plant tissue culture.

Almost every crop imaginable has been treated in this way in recent years: corn, tobacco, petunia, soybean, tomato, potato, carrot; the list is almost endless and is ever-growing.

The quantity of free-living cells that can be produced from a small chunk of an individual plant is limited only by space and money constraints. A one-half centimeter or smaller segment of a germinating soybean seedling could produce an ocean liner full of free-living cells in just a few years' time, given its geometric growth rate.

Such plant tissue cultures are important for two reasons: first as the basis for physiological studies of basic plant life processes that could lead to tremendous long-term benefits; secondly, and in the short term far more importantly, because researchers now have the ability to regenerate whole plants from many of these liquid suspension cell cultures.

From one desirable plant millions of virtually identical offspring could be produced through these tissue culture methods. The time element compared to more conventional methods of propagation can thus be shrunk from dozens of plant generations to just a few. (The entire process of initiating cell cultures and regenerating new plants is illustrated in Figure 1.)

This speed-up of propagation and the ability to work in the laboratory with free-living cells instead of whole plants has astounding practical implications.

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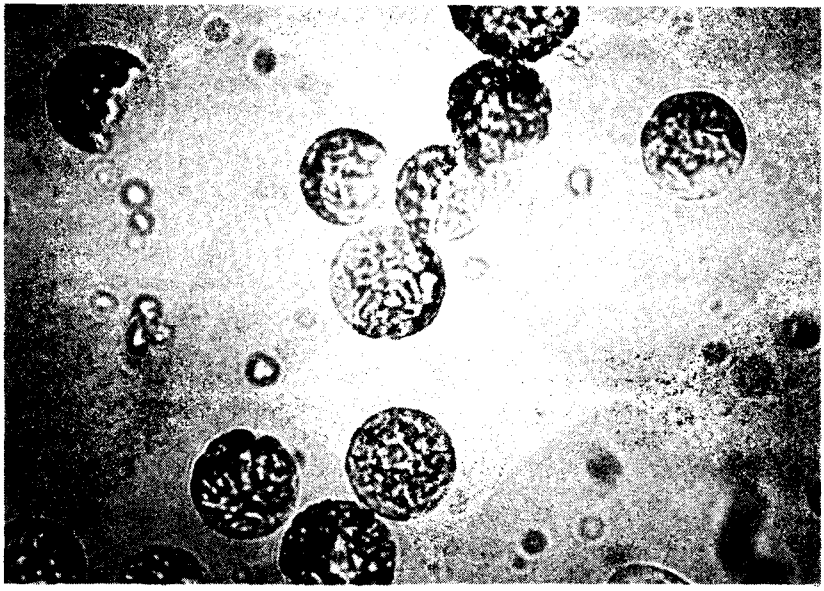

Figure 2: Protoplasts freshly isolated from bean leaves by the use of enzyme treatments. Each protoplast is a single cell which contains the full genetic blue-print of the entire plant from which it was isolated. For many plant species such as tobacco, potato, rapeseed, etc., such individual protoplasts can be regenerated into whole plants using modern tissue culture methods.

Let us take, as an example typical of those being worked on in the laboratory today, the desire to create a salt-tolerant crop—one that can be grown in soil that is ordinarily poisonous to the present type.

If you want to design such a "perfect" plant, you are obviously starting with an imperfect one. Somehow you have to change it (i.e., mutate it) to be what you had in mind.

What you want to find or create, then, is a salt-tolerant mutant. Under normal circumstances the procedure of choice would have been to use the arduous process of sexual selection.

This would mean planting hundreds of thousands of seeds in a moderately high-salt soil and hoping that one or two might grow better than the rest. Next year's procedure would be to plant seed from these selected, slightly more tolerant plants, and to hope that the salt-tolerance trait will reappear in the offspring and the trait prove itself to be genetically stable. Repeat this step for several years—generation after generation of plants selected and then grown on ever-increasingly high-salt soils—and with luck a new mutant line selected and bred from the old might be achieved that has the requisite amount of salt tolerance. The entire process could take decades.

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But now, in the laboratory using the new technology, millions of individual cells, each the potential equivalent of a whole plant, can be screened for salt tolerance in a single glass flask in a few days' time by simply adding high salt concentrations to the nutrient medium in which the cells are growing. Only the tolerant cells will survive. (Variations in salt tolerance can exist even in these cloned cells because every cell division that occurs has the potential for errors—mutations. Some of these mutations might affect the ability of the cell to tolerate high salt concentrations.)

The scenario then is to regenerate plants from these salt-tolerant cells, if any. Using these sorts of techniques, tobacco tolerant to a number of metabolic poisons has been produced.

But not only is the search for naturally occurring mutants made infinitely easier, the ability to manipulate these cells in liquid suspension culture allows for the creation of man-made variation. Flasks containing these cells can be exposed to mutagenic (mutation-causing) chemicals, which can be incorporated into the nutrient growth medium, or to various forms of radiation—all with the purpose of increasing the number of mutant cells to choose from by several thousand or more times. The chance, then, that a desirable variation will exist is thus magnified tremendously, and things which would have never come to be in nature can be manufactured in the lab.

Using this technology of tissue culture and cloning, plants by design are in the future of agriculture on Spaceship Earth. Selection for disease resistance, drought and cold tolerance, heat and salt tolerance, etc.: all will be possible and are even now being developed in the lab.

But perhaps the most exotic and exciting breakthrough born of the new cloning technology is the process called somatic cell fusion. This is the method by which two isolated plant cells, taken from whatever source, can be fused together in a test tube to produce hybrid organisms impossible in nature, though not to the imagination of the new plant scientists.

Normally all plant cells are surrounded by a cell wall which must be removed before cells can be fused together. When these cell walls are dissolved by digestive enzymes, the result is a spherical, membrane-enclosed sac called a protoplast, which is the body of the cell minus its fibrous container. The protoplast must always be maintained in a special, liquid medium to keep it alive.

When two such protoplasts are placed in close proximity under certain conditions, the cell membranes touch and (like two drops of oil) the protoplasts fuse together to make one large cell. In a truly successful fusion, the two parent cell nuclei (the nucleus is the computer brain of every living cell and contains the genetic blueprint) will themselves coalesce into one, and the resulting cell is truly a perfect hybrid.

Many such hybrids have been made to date. Examples include those made within the same species (tobacco + tobacco); those between two different but somewhat related species (tomato + potato) those between highly unrelated

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species (soybean + barley); and even those that cross plant and animal kingdom lines (tobacco and carrot cells have been fused with human cancer cells). But regeneration of whole plants has been limited so far to the first two classes of hybrids listed. In the other instances, only single cells or colonies of cells have been formed.

Where plants have been regenerated, as in the case of the tomato + potato hybrid developed at the Carlsberg Laboratory, the gross physical characteristics of the hybrids can be examined. In this case all of the progeny of the somatic hybridization looked more like tomato than potato, with some characteristics, especially flower color, being mixtures of both.

The so-called "pomato" represents an astounding breakthrough in genetic engineering: a necessary prelude to the production of truly useful "unnatural" crops in the laboratory. Using all normal methods, such hybrids are impossible.

The next step planned in the development of genetic manipulation techniques in plants is the ultimate dream of all researchers in the field: to be able to isolate, clone, and transfer individual genes from one plant to another.

A good example would be disease-resistance genes. It is very often the case that two related but non-sexually compatible species will have totally different disease susceptibilities. Species A will be protected from a devastating blight because it has a resistance gene to that particular strain of disease. Species B, on the other hand, is completely susceptible and no resistant mutants have ever been discovered.

How to get the resistance from A into B? One method, as described above, could be to use the somatic cell fusion technique (as if A were tomato and B were potato). But this method transfers and mixes up most or all of the genes of A with B and will likely produce a hybrid that is not close enough to B for the desired purposes (as the "pomato" cannot be used to produce a potato crop).

The best of all possible worlds, therefore, is to isolate the resistance gene from A, clone *the gene itself* into many thousands of copies, and add the many copies of this gene (and no other) to cells of species B existing in liquid suspension culture or as isolated protoplasts. The free-floating copies of the gene from A would be taken up by the cells of Species B, and a certain percentage of these cells would accept the transferred gene as a new, functional portion of the normal genetic blueprint in the nucleus (like adding an extra bathroom or an attached garage to a house).

Cells of Species B treated in this manner would be regenerated into whole plants, which would then be tested to see in which ones the disease resistance "took." The new "immune-Bs" would provide the basis for disease resistance that was previously unavailable to the crop in the "natural" world. Costly pesticide spray programs and/or an inevitable percent of crop write-off to the disease would be completely eliminated by the simple introduction of the new variety to the farm.

By the 21st century, this methodology will probably form the basis for an agricultural revolution of plants de-

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signed by people that will change the face of the world.

Modify the plant itself to fit the available environment whether in terms of disease resistance, drought tolerance, higher grain-to-leaf ratios, higher and more balanced protein concentrations, etc., and costs are dramatically reduced per food value unit.

Environmental restrictions (costly ones) will still exist and cannot be dismissed; there are no predictably useful varieties that promise, nor genes that can confer, the ability to survive on completely deficient or poisonous soils, without water, or choked by weeds. But every benefit produced by modifying the plant itself is a "freebie" once it reaches the farm, and can add to production at a next-to-nothing cost compared to what all other, externally implemented measures can do.

But again, promise and peril are opposite sides of the same coin.

The better the varieties produced, the greater the likelihood of their exclusive use in extensive monoculture. (Who, after all, would deliberately choose to plant an inferior product, especially when the margin of profit on the farm is so slim?) Uniform use of the genetically superior plant stock provides the greatest possible commercial benefits.

And yet, as has been observed historically from the Irish potato famine to Southern Corn Leaf Blight on *Tms* corn, dependence on just a few crops and/or a particular variety risks the greatest chance of catastrophic disease.

There are several ways to minimize these risks, from large-scale testing of the varieties before release for public sale to consistent monitoring of the changing disease races in the wild. As with influenza in humans, new strains (called races) are always arising from the old disease through natural mutation, such that this year's immune plant might well be next year's victim. Both of these safety techniques are standard procedures for world wheat production. They allow researchers and farmers to be aware of what to be careful of, what resistance genes to use, and which varieties should and should not be planted in a particular year.

But the only true safety cushion against inevitable epidemics, as well as the havoc caused by unpredictable weather—drought or flood—is the development and maintenance of a substantial food reserve whenever and wherever surpluses can be managed. Otherwise the ever-increasing artificiality of the human food chain (the only system that assures maximal and needed food production levels) is a deadly threat: of famine, economic collapse, and even war.

Unfortunately, the determination to maintain food reserves requires a command decision from the bridge and is not one that the workers in the galley are allowed to make. Too many times surpluses have been handled by taking farmland out of production, switching to "luxury" crops, or simply dumping.

Which points out the ultimate reality: all the problems of feeding the world are not scientific ones. Far from it. Political and economic inactivity or chaos on the bridge can negate and has negated many of the breakthroughs the galley

Please turn to page 93.

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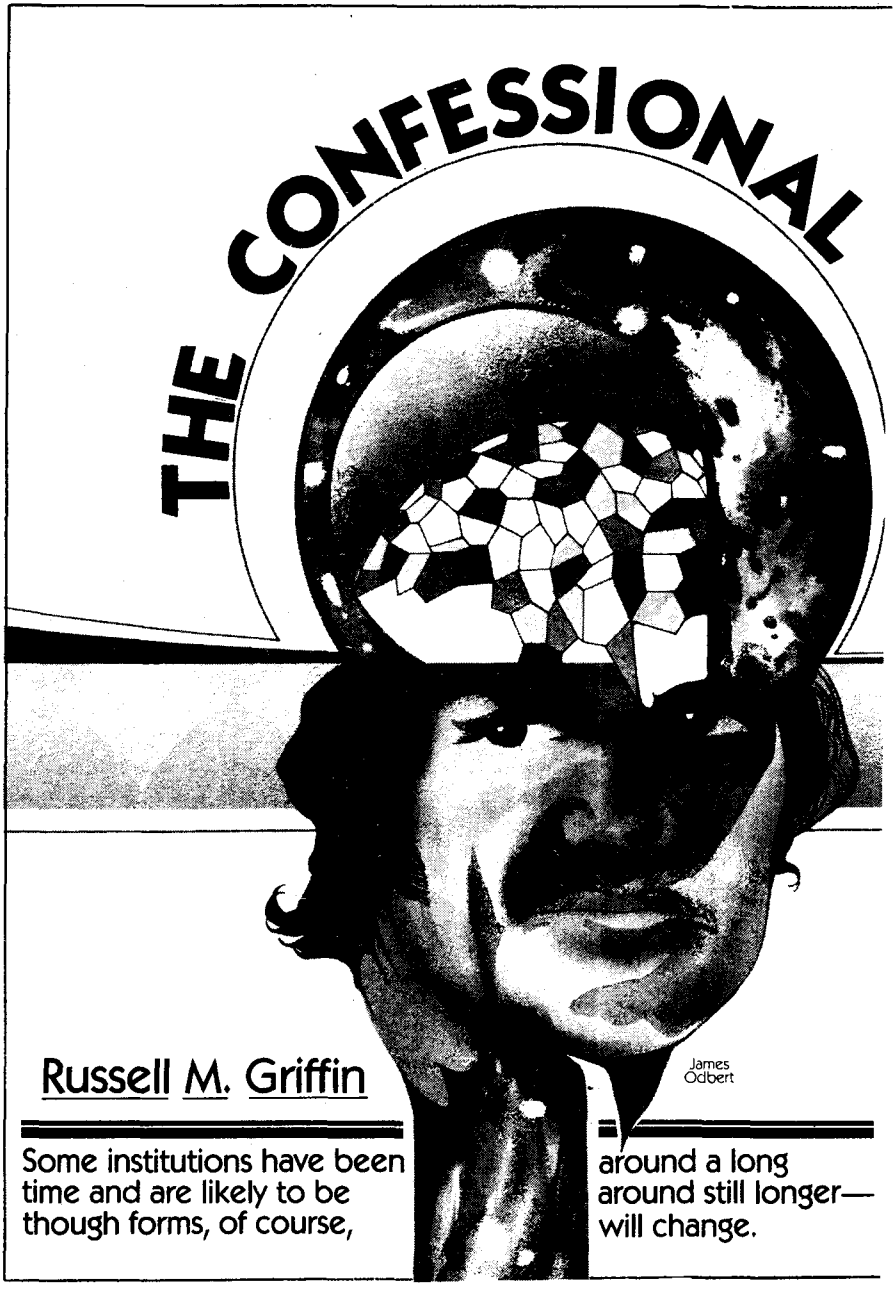
THE CONFESSIONAL



James Odbert

Russell M. Griffin

Some institutions have been around a long time and are likely to be around still longer— though forms, of course, will change.

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"Thank you," said the door as it slid shut.

Cal stood reverently in the white-noise hush of the MUDD room, wondering whether it was the Nuncio's impending visit or his own sleeplessness that had brought him. Then he touched the square for the Roman Catholic interface.

Solemnly, the seven-foot polyhedron began to revolve. Past Cal slid the Islamic facet's glistening blue tile and direction-finder for locating Mecca among the stars. Next came the rice paper of the Shintoist face, then the Hindu, writhing with multi-armed plastistone deities which looked downright homey to Cal.

The arrival of the Multimodal Unitized Devotional Device at the Federated Earth Embassy on Depaz had seemed the answer to a prayer; apparently, as someone had observed, one of the thousand names for God was MUDD. But when you were six light years away from Earth, on a planet too dreadful to justify a human chaplain for even *one* of the Embassy staff's religions, you tended to welcome anything that smacked of home.

Yet Cal, though he had arrived as the new political officer only six months earlier, had not come out of homesickness. He needed to talk, and what he had to say couldn't be trusted to another human being. Project Nimrod. Even the name chilled him.

At last the plastistone trefoil Gothic arch swung into view, the hydraulic arm for elevating the Host bouncing slightly above the narrow altar as it eased to a stop. A processional hymn blared from the soundwands.

"Excuse me," Cal said. "I just want to confess."

"*Infinite Thy vast domain,*" thundered the digital chorus. "*Everlasting is Thy reign.*"

"I WANT TO CONFESS!"

"*Holy—*" sang the chorus and snapped off. A small, metal lattice rose noiselessly from a slot to obscure the altar.

"Confessional access number, my son?" the machine asked solicitously.

"Guess I don't have one."

There was a disapproving silence.

"I'm not Catholic. Matter of fact, I'm not anything."

"I see," said the machine glumly.

"But something's bothering me, and I needed to kind of talk it out. In the strictest confidence, understand."

"Everything said to me is processed and stored in a fail-safe zero-access mode," the machine soothed. "The secret of the confessional is inviolable."

"It all started," Cal went on, turning his face away, "when I killed somebody." He paused. "I *think*. Or something. That's the problem with my line of work—you never know quite what you're negotiating with. Fact is, this person that I—who *died*, I mean —he . . . Actually, not *he*, exactly, because he . . . *it* . . . well, *they*, really."

"Take your time, my son."

"No, *they* is technically correct. A colony of, well, liquid-silicon semiconductors functioning as a single entity. As if each of our body cells—I mean, *my* cells—were individually intelligent. Do you see what I mean?"

"Absolutely," the machine said.

"Yeah, I suppose you would." Cal scratched his head. "Anyway, where

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it gets sticky is this colony was . . . a colleague." Cal sighed helplessly. "The Ambassador from Inouri, as a matter of fact. But when oxygen got into his krypton-argon atmosphere, it, uh, crystallized his liquid silicon into, um, a puddle of glass. Accidentally."

"Accidentally?"

"My gun blew a hole in his capsule."

"Were you cleaning your weapon?"

"No," Cal said miserably. "I was shooting at him."

"Not an accident, then," the machine said, as though making a note.

"But I didn't *mean* to. It's just everyone else was shooting and . . . See, we caught him altering the social dynamics of Depaz—making the natives like him, submerging their individual identities into a collective super-consciousness. Surgically, with telepathic implants and genetic engineering. And they're *humanoid*. It was unnatural, wasn't it?"

"Insufficient moral data field," said MUDD.

"All right, they're not just humanoid. The Home Office thinks they're human, descendants from one or two clone types possibly sent out with a mining ship by some pre-Federation country ages ago. They interbred when they were cut off by the Long War. At least that would explain why the Depasians are so godawful, wouldn't it?"

"All Creation is the Almighty's handiwork," murmured MUDD.

"But I'm talking a gene pool of one or two types, max. Think of the recessive traits in just one generation. I don't think you want to hang that kind of degeneracy on God."

"Processing," said MUDD. Background digital hums and whines began to bleed softly through the analog soundwands.

Cal cleared his throat. He hadn't gotten to the real problem, but it was so hard to put the enormity of it into words. He opened his mouth and found himself veering back into the past again.

"I shouldn't *feel* guilty. It was like shooting a big bowl of jam. Intelligent silicon jam, I admit. Pleasant, friendly jam. Everyone liked Drofsko at interembassy parties. But we couldn't let him get away with something like that. We're still trying to undo the damage." It was on the tip of his tongue, now. "So is there any category like preemptive homicide? Well, not *homi*cide, but . . . "

He stopped and took a deep breath. "Look, I'm not just talking about Drofsko or what happened in the past. There's a plan to trick the local ruler, the Dey, into hunting down the nomads Drofsko altered and . . . exterminating them. Project Nimrod. The argument is they're a security threat, and they're so changed they're not truly human anymore. Killing an aggregate entity like Drofsko was, well, mass murder, so I should be the last one taking a moral stand, but—it's wrong. Inhuman. Except I'm afraid to oppose the plan. The person behind it is—"

The beep from the pager on Cal's belt interrupted Cal's thoughts, registered that he was in a secure area, and opened a noncoded channel.

"The starship *St. Ulfilas of the Goths* has just locked into transfer orbit," the assistant's voice said over the pager.

Jesus, Cal thought. The Papal Nuncio already! "How soon does his shuttle touch down?"

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"Within the hour. Shall I call our driver?"

"He's probably drunk," Cal said. "I'll go straight to the garage." He ticked off the pager. "I'm *chargé d'affaires ad interim* till the Ambassador gets over his fly-bites from the last kidnapping. But keep an open channel—I'll be back as soon as I can. Remember—absolutely confidential."

Cal hurried from the MUDD room ("Thank you," said the door) and barked his shins on his desk. He'd forgotten it had been shadowing him since he'd been made acting chief of mission.

"Thank you," said the desk. Most of the furnishings had voice units to combat the staff's sense of being the only humans for light years in any direction.

"Stupid piece of *junk*," Cal hissed, kicking at it.

"I know you are, but what am I?" said the desk.

"Is this a malfunction or a practical joke?"

"I know you are, but what am I?" said the desk.

Cal reached over to tap a routine maintenance call into the desktop console, but the desk slipped lightly away. With an angry shrug, Cal threw himself into his powerchair and told it to take him to the garage. "Thank you," said the chair as it floated down the hall. Behind, like a phantom, followed the faithful desk.

Cal didn't notice. He was angry at having his conversation interrupted by the Nuncio's arrival. One of the complications of representing Federated Earth was that the Vatican had never surrendered its diplomatic independence. Even diplomats from binary systems had trouble understanding why so small a planet had two separate diplomatic corps.

As Cal glided through the west wing, he felt a twinge of fear and revulsion. Hara was standing in her office door. The brains, the heart and soul of Project Nimrod.

Hara was on the rolls as Attaché for Development, but not even a Depasian would have believed someone with an OWSR-2 rating was actually a development attaché. Hara had never admitted she was the intelligence plant that went with every embassy, not in so many words, but staff conversations withered and died when she came into a room, or veered in non-controversial directions, and Cal knew, without ever having been told, that she was the Embassy's *éminence grise*. Intelligence operatives, faced with light years of delay in getting their reports to Earth and receiving orders, had *carte blanche* from the Home Office, and Hara had been posted on Depaz longer than anyone else in the Embassy, long enough to have her own contacts and ways of getting what she wanted outside official channels. It was no wonder that she was treated with more than respect. It was no wonder she was never opposed.

Cal gave her a politic wave as he drew near, and she shot back a penetrating look with her old, tired eyes that he could feel on the back of his head the rest of the way down the corridor.

He ditched the chair at the garage door ("Thank you and goodbye") and managed to slip through before his desk caught up with him. He found their Depasian driver face down on the griddle-hot tarmac, covered with four-winged

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flies and completely gone on *mishipi*, "rat-bite," which the natives fermented from saw-grass. Garage dome echoing with the flies' buzzing, Cal stepped over him and stalked through the impossible heat to Moby Dick, the great white hovercraft the Home Office had sent to impress the Depasians. With a roar, he floated backwards under the opening doors and into the sunlight's glare. "Thank you and goodbye," thundered the doors. "Don't forget your salt tablets."

Grimly Cal swung onto the dusty road that led past the architectural extravagancies of Embassy Row. There were a little over a dozen embassies representing the advanced planets which, like Federated Earth, believed that anyplace as exquisitely awful as Depaz was bound to have some incredibly valuable resource if they could just endure it long enough to find out what.

But beyond the Row began the empty prairie, featureless, distractionless. No escape from the memory that already devoured Cal's nights. He saw again the obscene, squirming pile of Depasians he and Hara had found that morning in their search for the kidnapped Ambassador, a writhing mass of indistinguishable bodies slick and glistening with excretion and dew. And Drofsko, his liquid-silicon component creatures humped in a pillar to hold his transparent sphere steady, its atmosphere spotted with white flashes where his powerful thought processes ionized the krypton and xenon.

Whether the altered nomads had simply been startled and frightened, or whether their augmented telepathic abilities had sensed a murderous threat in Hara, Cal could not say, but all at once they had disentangled themselves into a living chain and rushed forward as one. Hara had begun to fire. Cal had hesitated, but Drofsko, globe suddenly clouded and opaque, had rolled toward him. Cal had squeezed the trigger.

Had Drofsko meant to crush him, or only to plead with him to spare his creations? Had Cal fired out of mistaken fear? Or out of horror at those misshapen heads bulging with implants, knowing they had once been human? Or had he, like Hara, simply fired out of political expediency to curb Drofsko's growing influence on Depaz?

Cal couldn't remember what had flashed through his mind in that instant. He remembered only his laser bolt's molten ring in the sphere puckering inward with the rush of oxygen, the oily rainbows of Drofsko's collapsing surface dulling with oxidation. Afterwards, two flies, eager for carrion, had bumbled through the hole and settled disappointedly on the dead fish-eye of glass.

Would he ever come to terms with it? Not as long as Project Nimrod hung over his head. How could he even begin to deal with the one when the weight of so many other deaths was about to settle on his conscience?

But there was no time for further thought; the landing field was already in view. Since Depaz was flat as glass, designating any one spot a landing field might have seemed officious, except that the Dey kept the area burned off. An important consideration in a world where the saw-grass could cut through shoe leather. Trailing a column of dust, Cal veered off the road and glided to a

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stop. He gulped a salt tablet from the dashboard dispenser, pulled his fly-net up over his head, and broke the door-seal. The fierce heat rushed up at him as he dropped to the ground.

Beneath the usual black nimbus of flies, a ragged cluster of Depasians hung on the far side of the field, jabbering giddily at this rare distraction from their dusty days and constant banditry. They kept a respectful distance from the official Depasian welcoming committee —another of the Dey's endless cousins, in a ceremonial robe, tracing a pattern in the field's carpet of dead flies. Behind him simmered his tractor of state, hissing and clanking as his slave blew off excess steam and hoped the boiler didn't let go. Drawn up behind was a paramilitary group on the cross between a camel and a horse favored by prairie nomads. They carried either musical instruments or blow guns.

Cal crunched across the fire-blackened stubble toward the minister-cousin. "May the dust not clog your nostrils," he said, offering the traditional greeting in broken Depasian.

"May the grass not cut your feet," answered the minister-cousin correctly.

For an eternity Cal cooked in silence and the flies crawled unheeded over the Depasian's impassive face. Despite his revulsion, Cal kept stealing glances at him. There was no denying his essential humanity. Smaller, brown skin leathery from centuries of exposure, upper lip enlarged like a cartoon leprechaun's in some obscure environmental adaptation, eyes heavily lidded against the prairie dust—but human. Not like the swollen lumps of Drofsko's engineering.

At last a bright spot flashed in the eastern sky, then swelled into the silver of the shuttle. Its blessed shadow swept over Cal as it descended into the dust of its retros. Stoically Cal watched the dust cloud roll toward him, then slapped on his respirator as the world melted into a brown gloom, flicked on his belt light, and groped toward the dying engine sounds. Behind shrieked ear-splitting, unearthly noises. So the riders had musical instruments after all—a Depasian reed band. Playing "Hail to the Chief." Possibly.

The Nuncio emerged coughing from the swirling dust, his black cassock flapping, a small, frail man leaning to one side to counterbalance a heavy, clanking bag. Cal stepped forward and shook hands, then waited for the minister-cousin so Cal could translate the exchange of papal and Depasian greetings. Just as Cal had rendered the minister-cousin's wish that the Nuncio should live longer than the *elik* but more cleanly, the Depasian crowd surged forward, a small herd of children scampering in front. Cal reached instinctively for his pistol, then caught himself. Not again.

"This way to the bitch!" the children shouted raggedly in English, pointing excitedly. "This way to the bitch!"

"*Scusi?*" said the Nuncio, nervously licking his thin lips.

"The *beach*," Cal sighed with relief. "A mud hole on the other side of the capital. The Dey's got it into his head to make it a tourist attraction. We can't seem to explain there isn't a prayer—so to speak. But we'd better get to the car before we're trampled." He hurried the Nuncio into a half run.

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"This way to the bitch!" hooted the disappointed children after them.

Cal clambered into Moby Dick behind the Nuncio and his clanking bag. As the door slicked shut ("Thank you") he hit the button for an extra burst of insecticide in case any flies had gotten in, then slid into his seat and turned on the engine.

"Always that is the problem," the Nuncio said, hacking on the perfumed mist. He had delicate features and pale, almost translucent skin.

"Beg pardon, Your Excellency?" Cal was intent on not running down any beach promoters, and the Nuncio made him uneasy. Even after only six months on Depaz, humans from outside seemed strange, even alien. Sometimes he wondered if Depaz were doing to him what it had done to the clones who had become Depasians.

"The terrafication of the planet," continued the Nuncio. "We tempt others into imitating us, as the serpent tempted Eve with the promise to be like a god. We are serpents in a universe of gardens."

"As a matter of fact, we're very strict about non-interference," Cal said, eyes on the dusty road.

"But we cannot help wanting to be attractive," the Nuncio said. "And it's hardest where the people seem vaguely human, such as here."

No, Cal thought angrily, all he'd wanted was to have them left as they were, and he thought again of the puddle of dull, dead glass somewhere out on the prairie, unhouseled and unannealed. The price he'd paid. "Aren't you in the missionary business yourself?" he asked, trying to mask his anger.

The Nuncio shrugged. "Admittedly, converting others to an Earth-born religion means walking a thin line, but we hold some truths universal."

Cal changed the subject. "We're expecting most of Embassy Row at tonight's reception. I guess I don't have to warn you some ambassadors will be in pressure suits, but if you've never run into a Tsaulian before, they tend to perch on chairs, and their excretory habits are like a seagull's except—"

"If there is time," the Nuncio said carefully.

"But everybody's been looking forward to meeting you," Cal protested. "I mean, it's so boring here we'd kill just for a new face at dinner—uh, just a figure of speech."

"I regret, but I must attend to a matter of some spiritual urgency. Then we will see."

"If you're thinking of missionary work, the Dey won't allow it. He claims to be the divine incarnation of—"

"I wish only to see your Multimodal Unitized Devotional Device."

"MUDD?"

"You have one, yes?" asked the Nuncio.

"Sure," Cal said, brightening. "You planning a human-run mass, or are you making some kind of modification? It's working fine."

"A matter of opinion. Your Home Office distributed the MUDD machines like entertainment units, without Vatican approval. Your people do not understand what means a thorough consideration."

"Yeah, but when it takes six light years just for instructions to get here,

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you've got to get things into the pipeline right away."

"Convenience has never been a priority with Mother Church," the Nuncio said. "How did your people imagine a machine could be Christ's own representative, a priest?"

"But if you programmed in the right formulas—"

"The miracle of the mass just formulae? Could a machine judge the sincerity of a confession or assume that awful burden of guilt before passing it on to Him? No, my friend, the Church has held firm through the centuries—only a human is capable of the priestly life's love and suffering."

Cal shifted at the mention of sin. "So what is it you plan to do?"

"For one thing, transfer MUDD's data banks to a dump box so I can review them to warn those guilty of mortal sin that their confessions were invalid and they must seek true absolution."

Cal froze. The Nuncio would hear *his* confession!

But before he could ponder the matter further, something pinged off the hovercraft's hull. He looked up to see twenty or thirty mounted bandits charging across the prairie. If it hadn't been for the second puff of smoke, Cal might have thought they were having an innocent race.

"What is it?" the Nuncio asked as Cal floored the pedal and the hovercraft wobbled to one side.

"Primitive projectile weapons," Cal said grimly.

"Someone is shouting at us?"

"Shooting, Your Excellency. We'll lose them in a second." He checked his rear screen to see his dust-wake roll over the pursuers. "What can I say? The only real law here is family ties. The Dey's adopted the entire diplomatic community as second cousins, but this kind of thing happens sometimes."

The Nuncio chuckled. "My diplomatic passport becomes a certificate of birth, then?"

"Believe it. These people hunt each other for sport, and to them we're not even that, well, human. Why, just last week our own ambassador was kidnapped for a few days." Cal scowled. He'd never heard of bandits taking on a hovercar. Could they be remnants of Drofsko's experiments? Maybe Hara was right about Project Nimrod.

Cal brooded silently the rest of the way, bypassing the official Embassy entrance for the protection of the garage. It was already late afternoon, and the protective grids under the dome had come on; Cal squinted against the surges of harsh, purple-white light of flies bumbling into the grids as he maneuvered to a stop. Apparently the native driver had sobered up and gone home.

So too, he discovered, had his desk and powerchair. Instead, when he had led the Nuncio up the steps and through the door's spurts of perfumed insecticide, the Nuncio refusing any help with his heavy bag, Cal found Hara.

"Thank you and welcome," said the door.

Hara's gray face was puckered in a sour look. "I need to see you when you've got a minute," she said, voice leaving no doubt about the urgency. Then she was gone. Cal's chest squeezed with panic. Why would she want to see *him?* He waited uneasily for the Nuncio to finish hacking on the insecticide.

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"You get used to the stuff eventually," he comforted. "Shall we go meet some of the staff?"

"The MUDD, yes please?" the Nuncio gagged.

Instantly Cal's fear of Hara gave way to resentment of this little man who was going to pry Cal's secrets out of MUDD. He summoned a Marine guard to lead the Nuncio to the MUDD room, then excused himself and hurried to Hara's office. It was worse than being spied on—it was indecent, and, he reasoned, it was driving him straight into Hara's arms. By the time he'd reached her door, he'd decided that he had a lot more in common with her than with priestly outsiders.

"Look," he said, touching the square to make sure her door shut securely, "before we get to whatever you need to say, there's something I—hey, why didn't your door say 'thank you' just now?"

"Gave it a lobotomy with a laser years ago," Hara smiled in the dimness. She kept her office in perpetual twilight, as though even she didn't want to see what she did.

"Think you could route a maintenance call on my desk for me?" Cal asked. "It's talking back."

"They do that sometimes." Solemnly she gathered the folds of her nomad robe and sat down; she had found native dress and local customs the best way to work effectively on Depaz. "All right, my boy, what was it you wanted to say?"

Despite his earlier purposefulness, Cal couldn't help a shiver at the sudden realization that this was the creator of Project Nimrod. Yet there was nothing frightening about her. She had no horns. She was kindly, almost, well . . . . fatherly. He glanced briefly around the room. Against one wall was a little shrine of mementoes from earlier posts—strange wisps of arterial metalwork, squat idols, odd implements that were apparently weapons. In the center loomed the rough, cruciform shape of an alien crossbow.

"I don't want to compromise your cover or anything," Cal began, "but you're the only person I can talk to about this, and I've got to be candid."

"About the Nuncio dismantling that prayer wheel downstairs?"

Cal raised his eyebrows, surprised. "How did you—?"

"Exactly what I wanted to talk to you about, my boy," Hara went on, lips curling with the slightest smile. "Your confession to MUDD this morning."

"You've bugged MUDD?"

"I thought we were being candid. What you tell MUDD or what you say in Moby Dick—it's all my business." Hara paused. "What's the problem? Didn't you come here to confess all this anyway?"

"But it was a matter of choice. I came because I'd *decided*."

Hara's shrug was barely visible in the gloom. "The results look the same to me."

Cal sank lower in his chair. "Anyway, maybe the Nuncio's bound to the machine's pledge of secrecy as his surrogate."

"I wouldn't stake my Annual Evaluation on any priest with a voice-print murder confession," Hara snorted. "You and I may understand this business has

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its own morality, and selective elimination can sometimes—''

''Drofsko was an accident.''

Hara looked up at the ceiling. ''Suit yourself, but the Home Office is six light years away. They don't care how we get things done, just so we don't get caught. But if this priest comes down with a bad case of moral outrage and blows the whistle . . . well, you're political officer, Cal. Do I have to draw you a picture?''

Cal's forehead grew icy with sweat, his fingers numb. ''What do we do?''

''I had the Nuncio's tickets lifted.''

''His diplomatic passport?''

''I have friends in the consular section. It's just too bad my other people screwed up en route.''

''You mean those bandits? They were yours?'' But somehow Cal was surprised only that it hadn't occurred to him already. Of course Hara had a gang of thugs, like every local potentate.

''It's going to take time to slip them into the garage—you know none of them'll take a piss without fifty cousins to back him up. That's what I wanted you for—to keep him busy for an hour.''

''And they'll grab the dump box without hurting him?''

''Jesus Christ, it's hard enough to explain to them what a dump box *is*, let alone technicalities about whether or not somebody should get hurt.'' Hara spoke with such quiet conviction that everything she said seemed overwhelmingly reasonable.

Cal had to struggle a moment to find his bearings again. ''You want me to play Judas?'' he faltered.

''I'm just asking you to withhold certain information and play footsie for an hour. Isn't that what diplomacy's all about?''

''I won't do it.''

Hara sighed. ''I thought you showed real promise at the shootout, but now . . . Maybe I should have drawn you that picture, the part about your career. I wouldn't want the End User's Report that the Depasian Desk at the Home Office will be putting in your file if the Drofsko business gets out. I like looking forward to retiring at full pension next year, myself.''

Cal's mind raced desperately. He'd been this way once, and whatever the price, he wouldn't go willingly again. ''Let me have that hour to talk him out of the dump box. *That's* diplomacy. Will you call off your people as long as he never listens to it?''

Hara thought for a moment. ''All right, your way may have a lower probable risk factor. But if he finds out anything . . . I won't be able to answer for the safety of either one of you. And don't think I won't know what you say.''

Cal made his way to the MUDD room on foot to give his nerves time to settle. Hara wasn't joking; she probably had the whole legation bugged. But how was he going to get the Nuncio to hand over the box without telling him why?

At the MUDD doorway (''Thank you'') Cal stopped, stunned. MUDD leaned at an insane angle amidst a pile of gears and bits of hydraulic linkages, as though a deranged squirrel had been loose inside, throwing out parts to look for nuts. The Nuncio was nowhere to be seen. Absently, Cal palmed the Roman Catholic square, and the machine

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began to wobble on its axis, then lurched to a stop at the Hindu face.

"*Once to every man and nation,*" the soundwands blared, "*Comes the moment to decide . . .*"

The polyhedron rumbled on, then stopped a second time, revealing a huge gap like a Gouda cheese with a wedge sliced out of it. In the empty space was crouched, mouselike, the dark shape of the Nuncio, outsized wrench in one hand.

"*In the strife of Good with Falsehood,*

"*For the Good or Evil side.*"

The Nuncio looked up. "Some minor difficulties," he smiled, reaching into the machine's center where a small black box was clamped to the axis's metal trunk like a maple-sugar pail. He drew it out. "So light for something that ought to be so heavy with sin, yes? A great disappointment."

"*By the light of burning martyrs,*" the machine burbled on, ever more slowly, winding down into deeper and deeper registers until it was inaudible. For another moment Cal felt the lowest frequencies reverberate through his chest, and then it stopped dead. He looked up and smiled. An inspiration—blackmail the Nuncio into surrendering the box by using his own churchman's logic!

"You've killed it," Cal said solemnly.

"Eh? Surely you understood that without Vatican approval, the Roman Catholic interface had to be removed. The altar wasn't even consecrated," the Nuncio said, preoccupied. "Of course, I'll restore all non-Catholic functions before I go."

"I'm afraid it's not that simple," Cal said. "Under the Cybernetics Laws, what you've done is murder, no matter how you cut it."

The Nuncio emerged and sat on the empty plastistone husk of the dismantled interface, from which the hydraulic Host-elevator sprouted like a wilted lily. Carefully, he laid the black box beside him. "The Church tries to obey all laws, but when there is a conflict, God's law takes precedence. And the simple fact is that a man-made thing cannot be murdered because it cannot have a soul. Only God can grant that."

"By that logic, I could go around shooting clones," Cal said. "If there *were* any around here," he added lamely. The fact that the Depasians were possibly clone-descended was too much a part of the dangerous secret.

"Not really. Mother Church condemned cloning from the start, but when in doubt she has always posited the possibility of a soul, and having no wish to condemn innocent victims, the papal bull *De Homunculis* established that clones possess a probable—if unnatural—extension of the donor's soul."

Cal glanced at his watch. Less than forty-five minutes left, and the man was more persistent than a Depasian fly. "But, uh, there are silicon life forms that operate on the same principle as the thing you just destroyed," Cal said desperately.

"Ah, I *see,*" the Nuncio beamed. "This is an academic discussion, because my diplomatic passport gives me immunity. But it is always a pleasure to discuss the fine points of theology with one who is genuinely interested. No, you see, a mechanical pump and a human heart operate on the same prin-

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ciples, but they are not the same. This MUDD unit is a cousin to your talking doors and furniture, not to man. Your silicon alien is another matter."

"*My* alien," Cal spluttered. What a stupid slip, he thought. If he weren't careful, he could get them both killed. Or—was it because the Nuncio had *already* listened to the confession? He looked around in consternation and found the Nuncio suddenly beside him, his smile fading.

"Is something the matter, my son?" the Nuncio asked. "Is this more than curiosity—something you want to talk to me about?"

For an instant, Cal wavered, his defenses gone.

"Confession can lift the burden of guilt," the Nuncio went on. "I have no idea if you are Catholic, but—"

How much Cal wanted to free himself of the agony of what he knew. To have someone lift from him not only the weight of the murder he had committed, but the responsibility for the bloodshed that was yet to come. But no, he realized. To breathe one word of Drofsko or Project Nimrod would be to murder this man as surely as he had murdered the alien. Yet not to get the dump box would be to ensure the same outcome. "No," he muttered, sagging with defeat. "It's nothing."

"Well, no one can confess for you," the Nuncio said, going back to pick up the dump box. "And as for this, I shall have to spend several days canvassing the staff."

"What for?"

"For anyone who went to this wretched machine for absolution. All confessions are anonymous, but I'd hoped this marvel of technology could at least tell me if any mortal sins had been confessed. Didn't I say the box was light? Your MUDD has one of the new zero-access devices. The memory was wiped clean the moment I tapped in."

Cal let out a sudden, hysterical peal of laughter.

"Did I missay myself?" the Nuncio asked worriedly. "My English—"

"No, no," Cal laughed again. "It's just me."

"Ah," the Nuncio smiled uncertainly, still suspecting some hidden joke. "Well, I think after my frustrations, I would now welcome that reception you promised, yes?"

"Of course, of course," Cal said, suddenly earnest. It occurred to him that Hara's bandits might still be lurking in the garage, and the farther the Nuncio stayed from that place, the better. "But if you have no use for the dump box, do you suppose I might have it as . . . oh, a memento? Of an unforgettable afternoon?"

The Nuncio smiled with puzzlement and shrugged. "As you wish," he said.

After Cal had helped the Nuncio roll the interface housing over like an empty pea pod and fill it with the odds and ends, he summoned a Marine to show the Nuncio to his suite to freshen up before the reception. Then he made his way to Hara's office.

He found it dark and empty, and for one heart-stopping moment he feared she had gone to give her bandits the go-ahead. No—she *must* have heard the conversation with the Nuncio. Considering how late it was, more likely she'd just gone to the reception.

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He found a spare powerchair and hurried down the corridor and out beneath the soaring arches of the main foyer. The first of the diplomats had begun arriving, and the cavernous room was pungent with insecticide from the opening and closing of the main doors. He found Hara resplendent in a fresh green robe, officiating at the receiving line. He motioned her over to one of the tinted floor-to-ceiling windows, out of earshot.

"You called off your people?"

Hara nodded. "So that box was empty all the time. What a kick in the pants, eh?" She forced a thin, nervous laugh.

Cal started. It wasn't possible that Hara had been afraid of the little priest—was it? But in that instant, Cal realized that it didn't matter. To save the Nuncio's life, he had shouldered the burden of leaving Drofsko's murder unconfessed, and, no matter what the consequence, he would not add to that weight. He held out the dump box as a final offering.

"What's this for?" she asked suspiciously. "It's empty, isn't that what he said?"

"For your memento collection," Cal answered. "So you can make sure for yourself." He paused. "And I wanted to let you know I've decided not to let it happen."

"Pardon?"

"Project Nimrod," Cal said clearly, almost loud enough to be overheard. He smiled to see Hara blanch at the level of his voice. "As political officer, I'm going to say it would be a terrible mistake. Those people are still cousins, and we have no right to decide their fate."

"My, my," Hara mused. "We'll have to see about that, won't we?"

"Yes, we will," Cal said. "At tomorrow's staff meeting."

Hara raised her eyebrows. "Well, here comes another carload of dignitaries stopping at the ramp. *Pax vobiscum*, kid." She turned back toward the receiving line.

Cal waited another moment, pressing his face against the cold glass and peering out at the endless prairie night. The grids were on, and he watched the brief, livid fly-stars burning in the darkness on either side of the ramp as the multilimbed diplomats rippled along it toward the door. He squinted to make out the real stars beyond the surging of the grids, then heard the doors slide open, the grids' crackling momentarily louder. He had been wrong before; now that he no longer feared Hara, he saw he had nothing in common with her, either. He breathed out, clearing his nostrils of the incense of the insecticide, and turned to find the Nuncio.

"Thank you and welcome," said the doors to the latest arrivals. ■

● Nothing more enhances authority than silence. It is the crowning virtue of the strong, the refuge of the weak, the modesty of the proud, the pride of the humble, the prudence of the wise, and the sense of fools.

Charles de Gaulle

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Thomas A. Easton

NEEDLE AND THREAD

Awesome features, whether natural or artificial, inspire guesses about their origins—and wars fought over which guesses are "true." Yet any of them may contain elements of both truth and falsehood. . . .

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The dry wind gusted. Zik Ohtar shivered, braced against the straps that held his waist and legs. He clutched the wrist-thick spars that framed his head. He thrummed in sympathy with the fabric panels that surrounded him, and he prayed the line would hold. He had seen others die when the upper airs blew too hard. Their frail craft had lurched and tumbled. He had no wish to join them, splintered on the rock.

The hills spread out below. He peered eastward, upwind, beyond the Valley of the Needle. He saw smoke and dust and moving glints of armor. The army was there, perhaps a day's march away. Its size was hard to guess, but from the dust it seemed no larger than his own, a thousand men perhaps, with wagons and beasts, with bows and swords and kite-borne Flyers.

A gust swung his gaze across the village below. It ringed the base of the ancient, metal Needle, a scatter of rock-walled huts. The Needle itself rose past him, more than two hundred times the height of a man. Even here, aloft on the wind at the end of his tether, he had to crane his neck to see the lip that circled its nose, the sill of that unattainable doorway. The Needle was far too thick to use a woodsman's belt—a hundred men could not quite circle it with their arms. It was too smooth to grip, and it was far too tall for ladders. The doorway, the Eye of the Needle, could be seen from far below, but it could never be reached.

Another gust, and he sought the enemy again. The Ramrans were coming to wrest the Needle from the lands of Nabor. They, like the Nabori, thought it a talisman or something more, an emblem of God whose possession brought fortune. Unlike the Nabori, they viewed it as organic, a steel growth from the bowels of the world, a phallus bearing Seed that would one day consume all unbelievers, and they worshipped it with rites that had forced the Nabori to bar them from the valley. Yet such things clearly did not grow. The Needle was an artifact. It had to be, said the Nabori, however colossal it was, however ancient and impossible. They knew not who could have built it except a God, and they worshipped it as proof of His existence.

Zik thought the struggle as pointless as any of the many in the past. The Needle was a pinnacle unlike any other, uniquely sheer, of metal instead of saner rock. Yet it was part of the world, and he could see no reason not to view it as just another mountain, albeit one carved by ancient hands. It could never have been smelted and forged like a sword.

Zik was willing enough to close his eyes to Ramran rites, obscene though they be. He wished others were as well. The Needle belonged to their world as a whole, like a mountain or a sea. It could not be moved, and in all truth, he thought, it belonged to no one more than to the Seekers who lived at its base.

Another gust. His view swung past the Needle once more. There was a bird there, high above Zik's kite, soaring even above the Needle. A thought occurred to him, a gift for Commander Torlit, and he kicked one foot to twitch the line. His crew began to haul him down.

A dozen handlers caught the huge box kite as it fell into the still air nearest the ground. Brisk hands released the tie-

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rods to collapse the panels and unbuckled Zik. Eager voices asked, "What views?" Torlit's force had been in place on the slope west of the Needle for over a week. Supplies were low, the dry lands of the region offered little forage, and the Seekers had little more than tubers in their storehouses. The men wished to fight no more than soldiers ever had, but they did want an end to waiting, a return to greener lands.

Zik crawled from the frame of his kite. He scuffed a boot in the dust and shook off a clawed hand. "They come," he said. "But I must go. I have a gift for our commander."

Voices rose in interest, harshly bright, a few with notes of jealousy. "What stripe of gift? What did you see?"

"A gift of the day. A gift of life." Zik would say no more. He brushed past the soldiers, paying little attention to the bright colors of their enamel, their open jaws and flaring nostrils. The blood ran hot within him, and they were not Flyers.

Commander Torlit was a gem of military manhood. His skull was a tapered oval, bulging behind with craft and guile, gaping before with the ivory of a born predator. His leathery hide shone with oil and the bony plates of his belly bore the Nabori emblems. Belts circled his waist and crossed his chest. From them hung badges of rank, tinder-pouch and oil-flask and whetstone, dagger and sword. A short kilt shadowed his limbs and covered the nub of tail passed down from the Ancestors.

Zik's own scutes were enameled only with the sky-blue of the Flyers. His gear was limited, a matter of weight. His kilt was no more than a loincloth, his belt a narrow strap supporting only a Nabori badge and a lean-bladed wand suited to cutting kite strings. He stood erect and stiff, listening to his gift's reception.

"I like it," the Commander was saying. "It should work, indeed, and it is time a way was found to scale that height." His jaws snapped with pleasure, and his yellow eyes gleamed. Perhaps he thought of fame, and wives, and a seat on the Council. All would be his if the gift were not base. The smile on his advisor's face said as much. San Juba, sleek and plump in gilded harness, was the Council's man, its eye and hand for this skirmish, and his report would carry weight.

One other was present, a man of the Seekers, an envoy of their Chief. He sat on a stool, a dingy robe covering unmarked scutes, his jaws askew in dismay. The skin of his face was dull with age and lack of oil, and his voice was sour. "This is sacrilege." He spoke softly. "The Needle spurns all climbers. It always has and it always will."

"Is that why you turn the climbers away, Suga?"

"We have held the town for only six centuries, a spot on the scute of time. The Needle's holiness was clear then, and it is no less clear now, when we permit only worship."

"Yet it was clearly built. It has a threshold and a door, and it was meant to be scaled."

"Not by the living. Is it not written in the Book of Gifts? The Gateway to Heaven is as the Eye of a Needle, and each man must thread his own way."

"We will thread ours now. We shall not wait."

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* * *

Torlit's force had but two Flyers. Zik was one. The other was the woman Firl Kana, one of the few who rode the kites, yet one of the best as well. She was lighter than the men and could rise more swiftly, jig more handily. At the College Bouts, students against each other and their instructors, she had cut a dozen lines, a record then, before finally falling to the water herself.

Zik had tried more than once to bring her to his mat, but never with success. She kept to herself, mateless and childless, aloof from Flyers and grounders alike. Her time and affection went to her kite and to the exercise of knifeplay. Yet she worked well with others when the need arose, as now with Zik. They were braiding new lines, enough thicker than the old to support their own weight at thrice the height. They were discussing whether they should loft while linked by the cord that would catch the Needle or risk a close approach to pass the cord from one to the other. Firl was confident that they could do the latter, but both knew too well the risk. They knew too that the risk was no less the other way. Both had seen seabirds, squabbling over garbage, brought to grief by a gleeful child. They had done the trick themselves, tying scraps of food to either end of a length of string and tossing them to the birds. Each scrap would be swallowed by a different bird, and when the birds would try to fly, usually in different directions, they would flail and flounder, rise and splash, until one disgorged its meal or both broke their wings and drowned.

Yet if the birds flew off in unison, they could survive, at least for a time. With a steady wind and few gusts, Zik and Firl could do the same. They had made their choice, their fingers still busy, when one of the handlers approached them. "A report," he said. "A sentry saw a rider leave the town, heading east."

"Suga's doing," said Zik softly. His eyes half closed as if in thought. "Gone to warn the Ramrans, to urge them to hurry and stop our desecration."

Firl laughed, a brittle snarl. "All he will do is start a race. But even if they reach the Eye first, they will be stranded there. We have the ground."

"For now. We cannot claim the Needle truly until we mount the pulley and raise the cable. Without them, a Flyer might as well be impaled."

Firl shuddered. "An air-fight, then." She drew her wand and waved it. She clashed her teeth.

By dawn, all was ready. The kites, already linked, stood poised on their timber ramps like farm wagons above manure pits. The new lines were wound on the capstans. The Flyers had slept and eaten and now they eyed the Needle. "The winds are strong," said Firl. "But still easterly."

One of their handlers laughed. "We have wagons for the capstans. We will tow you upwind, like fishers dragging the sky."

Zik laughed as well, a snort broken off by a cry from the edge of camp. "They come!" He leaped to his ramp, climbed into and through his kite, and stood atop that vantage point. The Ramrans were there, yes, and in the air above them a pair of kites, joined like theirs, and upwind of the Needle. His heart

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sank, and his stomach lurched. "Mount!" he called. "And loft!"

As Firl climbed her own ramp, he saw Commander Torlit nearing. He yelled at the handlers. "As soon as we're in the air, get those winches on wheels. Get us out there, and quick! Commander! We'll need an escort. They're in the air already."

Torlit wasted no time. He turned and ran, bellowing orders even as his Flyers were strapped in and their tiedowns cut. Seasoned troops, well-mounted, gathered by the wagons, helped the handlers boost the capstans into place. Beasts were harnessed and whipped to speed through the camp, east to the Ramrans and the windward reach the Flyers would need to thread the Eye.

As the wind seized him, Zik gasped. His spirit soared ahead of his kite, eager to confront the day, the fight, his fellow Flyers. He and Firl, and their opponents, were trying something never tried before, and if they had a hope of fame, it was only because they were the first to think of using the kites for more than the view they gave. Perhaps it was only that the Flyers were a young caste, founded a century ago when Jann the Elder first thought of riding a child's toy. Perhaps it was that Flyers had been at few battles for the Needle, that few had had the chance to think of his gift before.

His kite swooped aloft, as did Firl's, linked to his by a thread. A gust surged them together, and apart, with a jerk as that thread tautened. Would it hold? He could only pray. The kites lurched as the wagons began to move. They rose further as the handlers paid out the lines. He peered down. Men were hunched by the capstans, their arms rising and falling as they hammered in the spikes that would hold the kites to their tows. Others paced around them, releasing the coils of line.

He gazed ahead. Already he could see the other army, spread out to the east, a knot of armor blocking the road he would need to use. He saw the kites, aloft, high, higher than he had ever seen kites before. Would he be that high? Would the newly braided lines hold? He thought that surely the old ones would have broken, and then he brought his mind back to the moment. He drew parchment and charcoal from their pouch beside him, tied to the frame of his kite. He drew the ground and the array of forces opposing them. He folded the sheet, tucked it into a runner, a small metal tube capped with leather plugs, and clipped the runner to his line. It would slide down to his handlers. They would hand it to the escort's leader, who could then know what he faced and plan accordingly.

Zik drew his wand and tested the edge with a thumb. He looked for Firl and found her to his right, head and wand thrust from her box of panels, ready to close with the enemy. She hoped, he thought, to cut a line from below, a classic tactic and one that would spell death for both, joined as they were. Yet he knew they needed more reach. They were east of the Needle now, but angling west, and their handlers would need to win past the Ramrans below before they could hope to scale the Eye, even to approach the others' lines.

He watched the ground. Reinforcements were coming to both sides. Men were meeting, dying, and the fight was

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thickest near the wagons. Progress was slowing. He wrote quickly and sent another runner down. "Give us line!" He shifted his weight to steer the kite. He waved to Firl, gesturing his intent. She waved her understanding, and she too steered. They lined up north and south, the line stretched between them, and as they flew ever up they jockeyed to straddle the Needle ahead.

Their link stopped their reach as it struck the Needle's shaft. Then there was only lift, and they strained upward, bucking in the eddies near the metal, but rising steadily. Anxiously, Zik scanned the sky above. The other Flyers were near, so near! But they were off, too far to the south! They could not straddle as he and Firl had done. Yet—oh! the skill! One struck the lip! An arm reached, and held, and a body scrambled free of its kite to stand free and in possession. They had lost!

A line, suddenly slack with loss of tension, bellied past Zik's eyes. His wand flashed and cut, and the lander's kite blew from the lip. The second flyer, now unmoored and unbalanced, tumbled and a body fell. They had not strapped in! Such a risk, all for the few precious seconds needed in the landing, and now the price was paid.

Zik and Firl rose further. Now Zik could see the man upon the lip clearly. The face was familiar, a classmate at the College, Harus, once a friend, now a rival. It was the way of their caste. Loyalties had to be defined by their patrons, and the regrets had to be forgotten.

Harus held a wand, ready to fight off their landing. Firl rose close, and Harus's hand rose and fell. He threw his wand, and Firl screamed. Zik felt sick at the sight of her throat, fountaining red. He kicked at his line in sudden panic, and he kept kicking even as his kite withdrew.

He stopped only when his handlers unstrapped him on a bloody field.

Commander Torlit was furious. He paced the ground before his tent. He hissed and bellowed. He drew his sword and threatened. "Coward! You fled an unarmed man! Now *they* hold the Needle!"

Zik faced him steadily, though his belly trembled and the guards stood near. "Sir!" he snapped. "I did have my wand, but . . ."

"Coward!"

San Juba, sleek and gilded, touched Torlit's arm. The commander whirled. "Listen," Juba murmured. "This is not like you."

"Sir! I was strapped in. He was not."

Juba laughed. "If you wish to execute your Flyer, perhaps you should bind the executioner. We then could see who held the advantage."

"Aaahh!" Torlit sheathed his sword. "You are right, of course. But it is sad to lose with no more fight than that."

"Perhaps you haven't."

"With only one Flyer?"

"And a bow?"

Zik thought that he might succeed that way, if only Harus did not retreat within the Eye. But then he could land unopposed and follow him. The Needle *could* yet be theirs. He was opening his mouth to say as much when the blare of a horn forestalled him.

Commander Torlit raised his head. "The Ramrans! A parley?"

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San Juba reached for Torlit's belt and unclipped sword and dagger. "Talk is always better. The worm of peace never coils without it." He stepped into the tent to place the weapons out of sight. He added, voice muffled by the folds of cloth, "Wave them in."

The Ramrans wore no kilts, and their scutes were not enameled. Instead, they were clad in trousers and sleeveless jerkins. Their emblems of nation, clan, and rank were embroidered on the cloth. Aside from that, they looked much like the Nabori.

Their commander introduced himself only as Filad. He was accompanied by a handful of officers and one in purple robes who must have been one of their priests. He gave them no names, but plunged directly toward his point. "We hold the Needle," he pronounced. "It is ours."

"For now," said Torlit.

Filad nodded. "It is true. We cannot relieve our Flyer, and it will be difficult to kite him food and weapons. And you may well be able to displace him."

"We still have a Flyer."

"So true. But the battle has been fought. We have won. Yet we would like our Flyer back."

Zik parted his jaws. The commander who abandoned a Flyer, who cut a line in retreat, who failed to seek one downed at sea, whatever, would find few willing replacements.

"A trade, then? Harus for the Needle?"

"Not quite, I say. We have won. And we never wished the Needle for our own. We wished only the right to worship it in our own way, and you closed the borders against our pilgrims. Open them, bring down our Flyer, and the Needle is yours again."

Torlit moved one hand to his belt, as if to grasp his absent sword. Filad drew back, reaching beneath his jerkin. His officers matched his move. They were armed, after all, despite the usages of truce. Torlit's men reached for the blades they had set aside.

Torlit snarled, "We banned you for heresy. We will not . . ."

The priest raised a hand to placate. "Yet the heresy is not yours. The Burning will be ours when the Seed finally sprays."

"We will not permit your obscene rites in our lands! The Needle is a built thing, a made thing, no . . ."

San Juba interrupted. "A temple could be built for the Ramrans, to keep them from the sight of decent men."

Both groups began to relax. Zik, impatient as most Flyers with doctrine, chose that moment to offer, "There is a man aloft there. Ask him. Is the Needle built or grown? Does the Eye hold Seed or not?"

Both commanders glared at him. His belly trembled once more. He had challenged two faiths in one brief speech. He had not been wise, and he could not be surprised if both men chose to strike him. Yet they did not. They nodded, in unison, and San Juba said, "The knowledge will help the choice, and it is better before than after."

Two armies watched when Zik returned to the sky a day later. They were drawn up near the edge of the Nabori camp, just south of his ramp. The officers clustered around the capstan. San

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Juba stood upon the ramp itself, one hand upon the kite, saying softly, "Have a care, Zik Ohtar. War may be best, after all. There is no telling what hides behind the Eye."

"At least it eats us not. I see Harus from here." He waved the council's man away, and the handlers cut him free. The wind seized him and bore him swiftly toward the Needle. He was upwind now. He had the reach that would have let him beat the Ramrans the day before.

Barely conscious of the pack upon his shoulders, he scanned the ground as it drew away beneath him. He saw two lobes of men, separate and armed and spotted with pale faces that watched him rise. He saw the town, and the wagons at the Needle's base. They bore the cables he would need, the massive pulley, a basket that had once held tubers in a Seeker's storehouse, that would soon hold men.

He raised his eyes. The Needle loomed already, its rim a crescent blotting out the sky. He was near, nearer, and above it, looking down upon the stranded Flyer. He took the runner from its pouch, tied a line to its clip, and heaved it. It fell at Harus's feet.

The runner bore a simple message, penned by Harus's own Commander Filad: "Pull the Flyer down. Help him mount the cables." Zik watched as his one-time classmate read, looked up, and waved an arm. He relaxed as Harus put his strength to the line and hauled the kite from the air.

Zik touched down with a jar. He bounced as the wind strove to tumble him into the air again, but he quickly freed the tie-rods that held the panels, even as Harus yelled, "Zik!"

"Unstrap me! Now!"

The other bent to the task, as anxious as Zik that a sudden gust not spoil the moment. "Are we then still enemies?"

"For the moment, no. Harus, I bring you gifts."

"A wand?" The two words were soft, almost drowned out by the sibilance of the wind. Harus looked away and down. His shoulders slumped. Death would not surprise him.

"Food. And the freedom of the ground."

"Such as it is."

"Such as it is."

"There is a truce, then?"

"Aye. They choose death or open borders according to what lies behind the Eye."

"Ahhh, Zik! You . . ." Harus's eyes gleamed, his mouth opened. He had plainly seen, as plainly been awed.

"Not yet. First, the cables." Zik eased the pack from his back, opened it, and tossed the other Flyer a fold of bread and meat. He dipped deeper and found a coil of kite line. "Hold the end," he said. "And eat."

It took only moments to run twice around the Needle, narrower here than at the base. He paused each time at the Eye, torn by the urge to seek the cause of Harus's awe, but he pushed himself away to complete his circuits. He knotted the doubled line, drew a small pulley from the pack, slung it from its four-strand anchor, and found another coil. This he threw over the side. As it fell, he threaded one end through the pulley, hung the runner as a weight, and let that fall as well.

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"Now," he said. "They will draw up a heavier line and a stouter pulley. We will mount them like this." He gestured. "Then we will get a cable, and they will be able to hoist a basket up and down."

"The grounders will challenge the sky like Flyers then?"

Zik snorted. "How can they? Is not the Needle ground, however steep? Has it not always been?"

"Nay! Nay! Zik! I tell you . . . No, come and see!" Zik's jaws snapped. Harus was more excited now, his belly full, his mind freed of the need to flap his arms in useless flight. He would reach the ground alive now, perhaps live to teach at the College one day, as might Zik himself. Perhaps it was no wonder that whatever he had seen was mastering him now. Certainly it could not be the wonder his voice proclaimed.

"Not yet," Zik said. "We must first finish with this." They had a job to do, one that must come before any marvels. Yet it did not take long, and within an hour, the pulley was anchored and the cable was in place. The basket was attached below, and the gleam of gilt and purple told Zik their first visitors would be San Juba and the Ramran priest.

"Now," he said, and Harus led him to face the Eye in the Needle's wall. Zik noted the upward slope of the floor before him this time. He admired its drainage, and when he entered the Eye, he also admired the mirrored sheen of the walls, passing light into the cavernous interior.

Fully within the Needle at last, he halted, stunned. "Look!" said Harus. He looked. The walls were covered with pictures. How had they come here? Nearest the entrance was a portrait, a man, yet not a man, short-snouted, scuteless, heavy-boned, with flaps on the sides of his head. Another panel showed an alien figure with a tree-lizard, carving it with a knife into a true man. Were these their makers then?

"Look!" Columns of incomprehensible script flanked rows of pictures. Numbers. Triangles. "The geometers draw these."

"As when they compare the Needle's shadow to that of a man."

Blocks of text. Drawings that resembled nothing known to man.

"Knowledge," murmured Zik. "A library." This one room dwarfed the College's six. It would take a new band of Seekers, men more curious and industrious by far than the rabble of the town below, generations to decipher it all, to learn to understand and use it. The future . . . he knew, knew without a doubt, that there would be war and upheaval and change in all of life. He stared in awe, suspended in the moment, until the sound of voices brought him back.

"Zik Ohtar!" "Harus!" There were footsteps in the tunnel past the Eye, gasps. "It *is* built!" "The Seed!"

Both men were right. Neither faith was wholly wrong. But how many would see the truth in just that way? ■

● Nothing is more terrible than activity without insight.

Thomas Carlyle

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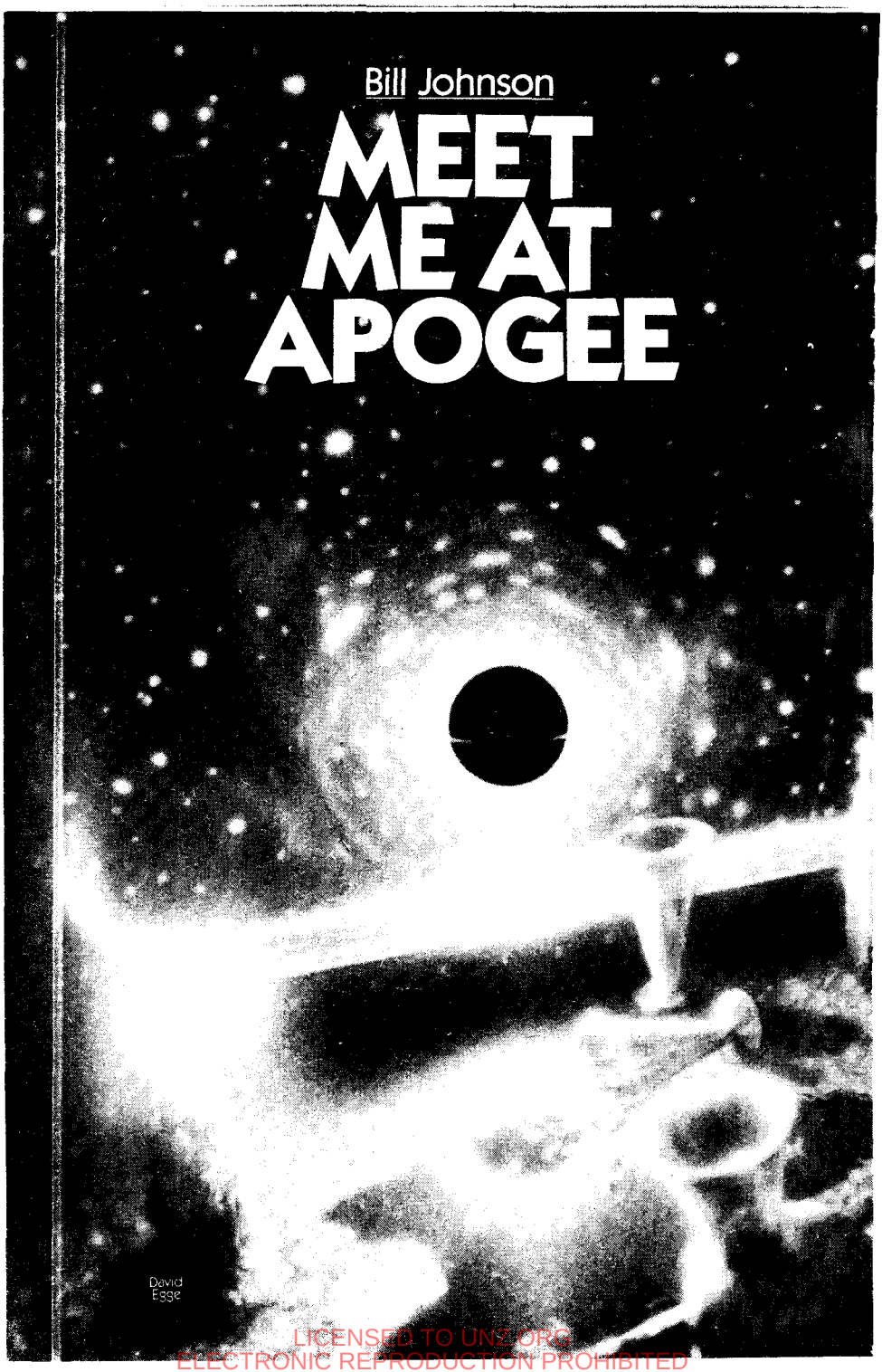

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Few people would
care to enter
a black hole—but
there may be reasons
for going very *near* one

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I went to the psych too late. She cured my gambling addiction and her bill joined the rest. The handwritten notes and the quiet men who owned them worried me the most: bankruptcy was not an option with them.

I did not understand it. I had played blackjack at other casinos and usually won. Enough money, enough hands, a good memory, and it is hard to lose money at blackjack.

I was determined to keep up appearances to the end. I had my bankers nervous now, but if I tried to go to a cheaper hotel they would panic.

Wheelside rooms with windows, not screens, were expensive but I liked a view. Three quarters of the time I could see the stars; the other quarter the black hole filled the view. I stared at the halo of bent and squashed starlight that outlined the hole and wondered how the hell I was going to leave.

The man found me later that night. I was in a casino, drinking not gambling. It amused me to keep the empty glasses on the table next to me, to keep score. It was a large stack.

"You drink too much. I'm not sure I like that."

When I drink my vision goes last. I might not be able to walk, and I might spill most of the drink on my face, but I can see up to the end.

He sat down across from me, a large man, basic human stock. No modifications, at least where I could see. Faint scars from a facelift, several facelifts, outlined his cheeks and eyes. A strawberry facial mark scarred his left cheek. The mark was lightened as if someone had run a laser over it to fade it. I was impressed. The only time you get a mark like that is after a rejuvenation, and it is usually very light. It darkens with each rejuve. I wondered how old he was.

He frowned slightly, took the drink from my hand and called a waiter to clear away the glasses. He ordered coffee for himself and lukewarm water for me.

"Alcohol is a diuretic. So is caffeine. You need to drink water to reduce your hangover."

I nodded, and regretted it. My head was large, somewhat bigger than the room, and nodding made everything bounce even after I was still. He spoke colloquial English, from my time, not that silly bird twitter they use now. That alone should have made me wary. I thought I knew all of the old-timers.

"Your name is Farrar Reinfeld. Six months ago you came back from a dive. You brought a number of items with you. A friend sent one of them to me. It is a piece of wreckage, a fragment of a ship my church sent into deep-deposit storage. The ship was reported lost many years ago. The Council of Disciples has instructed me to go down and visually inspect the wreckage, to see if anything can be salvaged. I need you to take me back down."

"I'm not going back to the hole."

"Mr. Reinfeld, you are in no position to refuse me anything. You do not have a choice."

"Go to hell," I suggested. He backhanded me.

The blow surprised me more than it hurt. I was already fairly numb. The waiter helped me back into the chair, then acted as if nothing had happened.

"Do not swear or blaspheme in my

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presence. I will not abide it. And do not think about Security. These people are in my pay, not yours."

I am not used to violence. Near the hole everything goes perfectly or you die quickly. I sipped at the water and tried to think clearly. He reached into his coat pocket and took out a credit slip.

"This will pay your legal debts." He placed the slip on the table. "This will pay your casino debts." He placed another slip on the table. "This is the fee that remains." He placed a third slip on the table.

I looked at the slips. The amounts were correct. He leaned forward.

"Mr. Reinfeld, try to understand. You have no choice, and no options. You will go back to the hole, and you will take me with you as passenger." He stood. He looked even bigger standing. "The slips need my counter-signature. My name is Reverend Pleasance. You can reach me through the hotel."

I watched him leave and wondered what I had gotten myself into. I placed the slips in my wallet.

"Go to hell," I said, and waved the waiter over. "I'd like some more water."

I laid the slips out on the table in my hotel room and tried to think things through.

I was a gypsy among the hole divers. I had no regular runs. Sometimes I ran people down to the Eternal Party when they missed the shuttle boat, or took odd-lot cargoes down to the two- or three-month levels. When nothing else was available, when I was desperate for money, I prospected in the Garbage levels.

The Garbage levels began at four-months. I don't mind the one- or two-month levels, where one day down is one or two months outside, but one day down for four months outside puts you out of touch pretty quick. The only reason to do it is money. Sometimes you find that down there, in the odd bits and pieces that have floated up from deeper, and sometimes all you find is garbage.

My last three runs had been to the Garbage levels, to a deep-drop Medical orbit for a diseased Grandee who wanted to wait for a cure to be discovered, and to the two-month level with a load of perishable fruit for a speculator. I had picked up the wreckage at the bottom of the Garbage level run.

I called the computer and accessed the data base for information on Pleasance and his church. Both seemed pretty clean and straightforward. A Christian offshoot started on a colony planet, they followed the standard Bible with the usual set of interpretations. They were against murder, theft, adultery, blasphemy, and heresy. They were for the family, God, freedom, and obedience.

The record also showed a Hatane license for a deep-drop, highly elliptical orbit. The license was very old, apparently one of the first issued to humans. The manifest showed various historical articles (Compacts of the Founding, Records of the Ministration, the Book of Hezekiah). One person, a caretaker, was aboard. According to the plotted orbit, at perigee the ship was very close to the event horizon, just above the region where the tidal effects started getting serious. Even at apogee it was only as high as the one-year level. (I know, I should say peribarythron and apbary-

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thron but it's just too clumsy. I was born and raised on Earth and when I think of orbits I always think in perigee and apogee.)

Pleasance had signed both the manifest and the accident liability release. I was surprised to find he was that old. There was also a final note: that communications contact was lost two years into the flight.

I did not want to go back to the hole. True, I had outlived everyone I knew in the real world but I still had friends among the other divers. Eventually, yes, I had to go back. First I wanted to get used to the world so I did not get too far out of touch.

I sometimes feel like a flat rock, thrown so it skips across the surface of a lake. The water is the real world, which I sometimes touch lightly. Then I'm gone and all that is left is ripples.

My last run, to the two-month level, took a week of my life. Meanwhile, half a year passed outside. The Garbage levels were all at four-months or more. According to the orbit license, apogee on Pleasance's ship was at the one-year level.

I called the union hall. Nothing. I called the companies, hoping they had a sick pilot. Nothing. I called Pleasance. He looked smug. I took a deep breath.

"I need you to sign these before we drop. The Hatane won't sign my ticket if I have debts."

"Of course. I'll be right over."

We dropped.

The ship was heavily shielded. We watched the outside through screens. Not that there was much to see: the hole is invisible, unless you are very close. I had never seen it and never met anyone who had. The Hatane know what it is like; their burial ships must be very close to the event horizon, but they do not talk about religious matters.

The Hatane who cleared me cared only about three things: was my license in order, were my debts paid, was my orbit legal. Certain areas are off-limits. Pilots who changed course into those areas did not return. For a price, an exorbitant price, the Hatane allowed exploration of those areas. I knew of three expeditions in the last century. They all returned empty. No treasure. But everyone remembered the glory strikes of the early years, so every few years someone paid the Hatane. They seemed to think it was all a great joke. I do not claim to understand the Hatane.

"This is very deep. Unusual." The Hatane was young, and looked like a badly drawn caricature of an opossum. Sometime they had lived on a planet. Now they lived deep in the gravity well and sent their young out to regulate hole use. When they reached a certain age, they went home. I got the impression they enjoyed their stint outside like I enjoyed my military service.

"It's a legal salvage run. Here are the papers."

"Perhaps," the Hatane said. He seemed to lose interest. He spoke to his computer (Hatane refuse to use keyboards) and then slid the papers into a wall socket. I heard the zip of a high-speed printer and the socket ejected the papers. I was approved.

Pleasance watched the clocks, one set to outside time, one set to in-ship time, for the first few days and then lost interest. I worked on my blackjack pro-

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gram and tried to figure out where I had gone wrong.

We passed the six-month level and were deep in the well. The casual tourists and most of the working levels were far above us. Occasionally we passed a medical boat full of people who could not take suspended animation, but mostly we were alone.

The radiation count went up steadily, but we were well within the shielding limits. The ship, an old war monitor I got at surplus, had tide compensators but I had never gone deep enough to have to use them. This trip, at our perigee and the wreckage's apogee, we would still be far above the tide levels, but it was nice to have a backup. It was a big hole.

I was working on the compensators, checking the fluid level and resetting the control sensors, when Pleasance came out of his room. He was dressed in a pressure suit with radiation baffling. I watched, silent but interested, as he cycled through the airlock.

He moved deftly in zero gravity, with the relaxation of long experience. This made me curious. Where would a religious leader have gotten zero-gravity experience? It was not in his computer records.

He took instruments from his backpack. Once he used some sort of optical device and took sightings. He finished his work and clambered inside, suddenly clumsy in the gravity. He looked thoughtful.

"I cannot find the wreckage. I looked all along the orbit. I checked twice. Are you sure we are on the right path?"

I put my tools, except the welder, away and settled myself before the console. The main screen was centered on the hole. I shifted the angle slightly and increased the magnification.

An image, blurred and distorted, appeared. Pleasance inhaled sharply.

"That's the ship?" I asked.

"Yes. It was a custom job, designed to our specifications. No other looks like it." Pleasance frowned. "Why didn't you tell me you found it?"

"I wasn't sure. I found it just a few hours ago. I wanted to get more data."

Pleasance looked puzzled. He opened his pack and showed me an instrument. It was an electronic telescope, extremely powerful, compact, and expensive.

"Why couldn't I find it?"

I handed the telescope back to him. "The fragment I brought back was blackened, pitted. There is nothing out here to cause that. Therefore something on the ship caused it. Probably an explosion. The ship is off its old orbit. I've had the computer working a search program with the telescopes."

Pleasance nodded impatiently. "Yes, yes, I understand. My people came to the same conclusion. But I checked all the likely orbits. I found nothing."

I shifted position and made sure I could quickly grab the welder. When Pleasance gave me the telescope I got a quick look inside his pack. I did not know why a man of God carried a spot-laser, and I did not want to find out.

"Maybe you weren't looking in the right place," I said. I expanded the screen to include the hole and beyond.

Another image of the ship appeared, skewed at an angle from the first. The first image was brighter, clearer, but the second was recognizable. As we

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watched, another image, even fuzzier than the second and in a different corner of the screen, glowed into view.

"When you get close enough to the hole it acts as a gravity lens, bending light from any object in orbit around it. If you looked directly at such an object, you would not see it. That light is bent off in another direction. But if you look somewhere else you will see an image, an illusion, of the object.

"The bright image is the primary. We can see some of the others, the secondaries, but not all. None of the images corresponds to the true position of the ship. The only reason we can see the ship at all is that you used magnetic screens to deflect energetic particles from the hole. The light from that collision illuminates your ship. This tells us one thing: at least some parts of the ship are still working."

Pleasance was silent, digesting the information. I had a feeling some people back home were going to be in trouble for not foreseeing this.

"Can the computer sift the images, find the real object?"

"If we know the orbit. Otherwise the object gets lost in its images."

"The wreckage was blackened. We must assume there was an explosion. Therefore the ship is off-course, on a different orbit."

"That's right."

"Then why did you let me hire you?"

"I needed the money."

Pleasance flushed and his fists clenched. I watched him carefully. I gripped the welder and put the tip on stand-by heat.

He stopped moving toward me and relaxed. He looked thoughtful and glanced at the screen.

"I judged you an honest man, Mr. Reinfeld. Have I made a mistake?"

He moved back a step and sat in the flight engineer's sling. His gaze casually swept over my hand and the welder and then back to my face. I turned the welder off and set it down, close to me.

"There is one time when the images tell you where an object is. When you and the object are in the same plane, on opposite sides of the hole, the images appear as a ring around the hole. I propose to move around, to go fishing for the ring. Give me a half-dozen points, for safety and margin of error, and I'll plot an interception."

He gave me enough credit not to ask if it was possible. The outside time clock showed that four years had already passed. I think we both wanted to do our jobs, the faster the better, and go home. I hated learning a new language when I came back from a dive, and this one was starting to stretch out longer than I liked.

"How long do you need?"

"Two weeks. Any more and we're wasting our time. I've got the likely orbits and planes. If it's too far off, we'll never find it."

"Would you like a bonus? If you find the ship."

"Accepted."

With that Pleasance left the control room and went to his room. I began to write a program to find a ring around a star.

It took eight days to find the first ring. The hard part was finding the right orbit

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so the wreckage was directly opposite us. Three days later I had another half-dozen sightings, and the computer had an intercept point plotted.

Pleasance was not excited by the news. He seemed withdrawn, introspective. I tried to enter his room, when he was asleep, to remove the spot-laser.

I got nowhere. He had new locks on the door. I must also have disturbed some kind of tell-tale. The next day he looked at me strangely. When I glanced inside his backpack the laser was gone.

As we closed with the wreckage the images became fewer and stronger. Finally the last secondary merged with the primary. We were now so close to the ship that gravity did not appreciably bend the light before it reached us.

Our shielding protected us as we passed through the wreck's magnetic screens. The ship was headed out, toward apogee. Most of the collisions with energetic particles occurred on the far side of the wreck. The result was a cold, flickering strobe-light that made the ship seem to jerk and move.

The ship looked like a misshapen barbell, one sphere much bigger than the other. The drive was in the larger sphere, living quarters in the bar, the sacred objects in the smaller sphere, as far from the drive as possible. I frowned.

The explosion had occurred in the bar, not the drive as I had assumed. Both spheres seemed undamaged but the living quarters were ripped and spilled into space. The ship pivoted slowly on the larger sphere.

I watched Pleasance as he watched the ship. Again he surprised me. He seemed to study the bar far more than he studied the smaller sphere, as if he was searching for something. This was not what I expected from the religious leader who hired me to find his precious relics. He noticed my attention.

"I'm looking for the caretaker. The explosion was only a few months ago, ship time. Survival would not be impossible."

I took us around the wreckage so we had photographs of the entire structure. The bar was totally shattered, a twisted metal and plastic wreckage. The spheres had been scored by fragments from the explosion, but seemed basically sound.

Pleasance was exasperated. There was no sign of the caretaker. I figured the man must have been blown out of the ship, but Pleasance did not want to listen to me. He went outside and used his telescope. When he returned I could tell by his expression that he had not found anything.

His hesitation made me nervous. I tried to think of a good reason why we did long-range exploration instead of going to the ship. I could not think of a good reason.

"How long to apogee?" he asked.

"About two days."

Apogee was our decision point, our farthest position from the hole in this orbit. After that we closed with the hole, and we were stuck for the rest of the cycle until we again reached apogee. We had used so much fuel getting to this point that I did not think we had enough to leave if we were closer than apogee. I had calculated that the entire cycle took about eighty years, outside time. Pleasance was not paying me enough to make me lose eighty years.

"Can we tow it?" he asked.

I laughed. "You've seen that ship.

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It's not strong enough to take a tow. I'd rip the hull and spill everything out as soon as I tried. If you want the stuff on board, you have to go down to get it. We leave the ship where it is, a little present to the Hatane. Maybe they can use it for something."

Pleasance thought for a moment, then nodded reluctantly.

"Then we don't have much choice, do we? Suit up and we can go over."

"You go over," I said. "I'll wait here and look for the caretaker. I haven't done any zero-gravity work in years."

Pleasance sighed and leaned toward me. The spot-laser was not pointed at me, but it was in his hand. I noticed the safety was off. I wondered where he had hidden it before.

"As you pointed out, we don't have much time, Mr. Reinfeld. I don't trust you enough to leave you here, in control of my ticket home, while I'm down there. So you have a choice. If I were you, I'd suit up."

"You're insane. If you kill me, who is going to get you back topside?"

Pleasance bowed his head, but he never stopped watching me and the laser never wavered.

"The Lord helps those who need his help, Mr. Reinfeld. I have a little deep-space experience. With the Lord's aid, I think I could manage. By the same token, the Lord tells us not to call on him except as a last resort. Killing you would be that last resort. I do not intend to do that unless you force me. Please suit up."

I suited slowly, stalling for time, trying to think. Pleasance waited patiently. He did not seem in a hurry. All too soon I was ready and we left the ship.

Pleasance wore a maneuvering pack and strapped his instrument pack to his chest. My suit was bare except for a small tool kit I wore at my waist. Pleasance held me in front of him as a shield. I realized he was absolutely serious. He expected that if I was killed, the Lord would help him pilot his way out of here. He moved us toward the wreckage with small bursts from the maneuvering pack.

"You think he's alive," I said.

"She," Pleasance corrected. "I don't know. I placed the bomb carefully; it should have killed her. But she is very lucky. I failed before, and I suppose I could have failed again. I prefer not to take chances."

Somehow I was not surprised. In fact, I was not listening particularly closely. The only thing I wanted to do was to keep him talking, to distract him, in case I thought of something to do.

"Is anything you told me true?" I asked. "Just out of curiosity."

"Mr. Reinfeld," Pleasance said. He sounded hurt, as if he was not used to having his word doubted. "I am not really very different from what my records show. I am ordained in the church, and I minister to my parish. I find the work very rewarding and fulfilling. I sincerely wish I were home now, working on my Sunday sermon or doing almost anything but what I am doing."

We were much closer to the wreckage. When I turned up the magnification in my suit I could pick out individual rooms in the bar. I thought I saw something move in one of the rooms. I shifted my position, ever so slightly, to make

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myself less of a shield. His grip tightened when I moved.

"Then what are we doing here, Reverend? What are we looking for?"

"Schismatics, Mr. Reinfeld. Schismatics and heretics," he said. The closer we got to the wreckage the more nervous he became. He crouched behind me now, head darting from side to side.

"A long time ago the church was rent by dissension. One man seemed to be the source of the trouble. The Council of Disciples decided that he must be silenced. An Angel of Mercy was dispatched to deal with him."

"You?"

Pleasance was silent for a moment. When he spoke again his voice was very soft.

"It was a long time ago, Mr. Reinfeld. A certain young man, whom I knew very well, was selected for the task. He was very fervid, this young man, exceptionally strong and single-minded. He obeyed instructions without thinking.

"He fulfilled his commission. The man was dead. But the Council was mistaken in its judgment that this would solve the problem. The Council was not infallible, as Doctrine teaches. The dead man became a martyr, a symbol, a cause. He rose from the dead, much stronger, speaking with a thousand voices, thinking with a thousand minds. We could not kill them all."

"So reform came to the church?" I asked.

"Softly, Mr. Reinfeld. Very softly. I did my small part to nurse it along. The church teaches us that rejuvenation is not good, that man is allotted a natural span and that extending it detracts from God's plan. But I underwent rejuvenation, not once but many times. I will not talk of my guilt. But I had to stay alive. I was the pivot, the fulcrum the two groups could use. The church must remain one."

We were now close enough to examine individual rooms without using the suit magnifiers. Pleasance killed our forward momentum and moved us sideways, slowly and carefully examining the wreckage.

"Is the caretaker your last schismatic, then? The last threat?"

"No," Pleasance said. "She is not even very religious. But her father was the man I killed. Both sides were trying to use her after his death, and no matter who succeeded they would have torn the church apart."

"So you tried to kill her."

"I had no choice, but I failed. Her father had friends, powerful friends, who took care of her. They got her aboard the archive ship, and I got a bomb on board with her."

"But your artifacts, your documents."

"The church is its people!" Pleasance said hoarsely. "I had to keep that in mind. Still, it was not pleasant. I am a very religious man, Mr. Reinfeld. I believe in my church and my God, and I believe I will go to Hell for my deeds. But when you brought back that wreckage the church saw a chance to find the ship. I was afraid they would also find the woman. Even now there are groups that would use her. I will not allow it."

"And if we don't find her?"

"Then I add a little to my guilt, and we remove the holy objects from this ship. We go home."

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"What about me?"

Pleasance sounded amused. "Afraid you know too much? I'm sorry, Mr. Reinfeld, but you are not that important. My word would carry much more weight. As far as I am concerned, you go your way, I go mine. I will even show you what happened to your blackjack game."

"You planned that!"

"Of course. I needed you, Mr. Reinfeld, and the casino people were remarkably easy to bribe."

The next few minutes are confused in my memory. We were about halfway down the bar toward the small sphere. Pleasance had swung me slightly to the side so he had a better view of the wreckage.

Something moved in the wreckage. I saw a flicker of motion in my peripheral vision and ducked. My movement swung Pleasance into the open for a few seconds. He was using the maneuvering pack and cursing when the arrow struck him in the arm.

He screamed, and let go of me. I hung in space, free, but unable to move. There was nothing to push against, nothing close, except Pleasance. He was busy sealing his suit and trying to get a fix on his assailant. I was a big, fat target waiting to be punctured.

So I kicked.

My feet caught Pleasance and sent him tumbling backward. The momentum sent me plunging toward the bar. I could hardly miss, but I could not pick my landing spot. I tucked myself into a ball to minimize my impact area, and waited.

The trip seemed interminable. All I could see was jagged metal and sharp edges reaching toward me, and all the emptiness around me. There was a man with a laser behind me, a woman in front of me with sharp, pointy things, and nothing and nowhere to hide. I tasted copper, my stomach hurt, my back was twisted and I hoped that whatever got me did not hurt.

I must have closed my eyes just before I hit the wreckage. I remember the sick feeling you get when all the air is knocked out of your lungs and the panicky, feathery feeling as I tried to breathe. Suit material collapsed gently against my arms and legs but the suit's compression rings kept the trunk and helmet airtight. I spent a few precious minutes using my tool kit to patch the holes and rips in the skin of the suit.

One leg was badly bruised and bent, probably broken. I did not have time to fix it. I numbed it and started moving, hand over hand, through the wreckage. In zero gravity the leg did not hinder me.

"Reinfeld, you have one minute to come back. After that, I must consider you my enemy. I do not want to do that, Reinfeld. Come back while there is time."

His idea was probably correct, and the safest thing to do, but it was hard to forget the way he used me on the way down. Right now I did not have a laser in my back, and I was not his damned shield. I wanted to stay a free agent, at least until I had a plan.

I did not know where he was, except that he was some distance away. The suits come with two radios, one for short-range and one for long. He was using long-range, and a special control in my helmet gave me a read-out on the signal strength. I moved toward the

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larger sphere, and the read-out showed that his homing signal was stronger. I stopped and moved the other direction, toward the smaller sphere. The signal got weaker.

He did not ask me again. I was looking back, trying to find him, when I saw a puff of metal vapor rise from the bar. A few seconds later a second puff materialized, illuminated from within like a lantern as metal vapor cooled through the spectrum.

He was randomly firing into the wreckage, probably at bright spots of reflected light or, if he had an infra-red scanner, at random collections of heat. It was not a policy likely to attain success. Most likely he was hurt and frustrated and angry. Eventually he would give up and return to the ship, to mend and think.

It encouraged me to think of Pleasance in a blind rage. I have never been afraid of men like that. They are too emotional, too likely to make a mistake that gives you an advantage. Unfortunately, we were not in a bar or a gymnasium. I was on a wreck, with a (possibly) broken leg, and no way to leave. Somewhere around me was a desperate woman, chased across the stars and many years, with a weapon. Above me, trying to kill me, was a man with a maneuvering pack, a laser, and my ship.

My ship. That part particularly galled me. I had worked a long time for that ship, and on it. When I thought of it I thought of all the (biological) years it cost me. I thought of all the deep-drops, the garbage runs, the gradual out-running of my time and place before I had the money to buy her.

I wound myself through a particularly tangled collection of wiring and tubing, having to be careful due to my leg. I was now deep in the wreckage of the bar. If Pleasance passed directly overhead I would not see him, nor he me. I was safe, for the moment.

The light blinded me before the helmet shielding polarized. Even so, that single instant left me blinking and groping in the air, a man trying to see with his fingers.

Something touched me on the shoulder. I jerked as if I had been grazed by a live wire, convulsively thrusting myself away. It did no good. I was gripped and pulled forward.

My sight began to return. Inside my helmet the radio light switched from long to short-range. The digital frequency controller spun through its paces so fast all the numbers looked like *8's* as it tried to match the incoming signal.

". . . ight! Are you all right!"

I nodded and the hand let go of me. A shape that resolved into a spacesuit drifted away from me, took a position at the opposite side of the little clearing we were in. An arrow-firing device of some sort was aimed at me.

I was getting tired of being the only unarmed person but it looked like it was going to stay that way until some kindly person armed me. This did not seem likely. So I remained calm and quiet and made no sudden motions.

We examined each other for a few moments. I could not see her face, of course, through the helmet, but I could examine her suit. It was an older model, of uni-body construction. That meant that if something went wrong, you had to tear the entire suit apart to fix it. It

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also meant that, unlike my modular suit, it had a maneuvering unit built in.

She started to speak and I waved her into silence. I checked my signal strength monitor. Nothing. Which meant two things might have occurred: Pleasance had returned to the ship, or he had turned off his homing beacon. Turning off the beacon involved opening the electronics and burning out one section of the signal control chip. A delicate job, but not impossible. Unlikely, though, in such a short time. I spoke.

"He's gone. It's safe to talk."

"Who are you? What the hell is going on? Who is he? How many are there?"

"My name is Farrar Reinfeld. I'm the pilot. He's down here to kill you. There's only the one of him."

She started to ask more questions but I waved her silent.

"He's gone now, but he'll be back. He's not stupid and he's got equipment I don't know about. It wouldn't surprise me if he has a radio detector. If he comes back outside and uses it, and we're still talking like this, he'll find us."

"I have this," she said, and hefted the weapon.

"That's very nice, and I wish you would aim it someplace else, but the only reason you got him was surprise. He was using me as a shield in case you had a laser. You must not have one, or you would have used it. The next time he comes out he'll have something that will stop an arrow."

She mulled this over for a minute, then nodded and slung the weapon over her shoulder. The carrier wave hum from her radio stopped. I also switched off my radio and followed her through the wreckage.

Somewhat later we arrived at the smaller sphere. I was relieved. The numbness in my leg was starting to wear off and the pain was getting bad. She opened an airlock and we clambered inside.

When she opened the inner door the gravity came on. My leg supported me for maybe a second and then decided that was enough. I crumpled to the floor in a faint.

I woke slowly. Overhead, far, far away, I saw the roof of the sphere. The pain in my leg was down to a dull ache, annoying but localized. I gingerly tensed the muscles.

It hurt. I tried again. It still hurt but I could bend the knee. I sat up and tried to stand. I did so. I tried to walk. It worked. I had to limp so much it felt like the deck was moving under me, but I could get around under my own power.

"Good. It was bruised and punctured, not broken. Should heal clean."

I looked around. She was seated atop a glass display case, open, wherein rested her arrow weapon.

She was older than I and her face was lined and worn. Not a great beauty but then I had watched the fashion of beauty change so much that I was not even sure what the style was when we left for this drop. By the time I got back the style would have changed again. She was not ugly. I pointed to the case.

"Sacred weapon?" I asked.

"The Bow of Glenda. Comes complete with arrows."

I nodded.

"This might seem a stupid question but I was not exactly a volunteer. What's your name?"

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She laughed. I liked the sound. It was a nice soprano.

"Sharlee Espa. I had already decided you were not a volunteer. That leaves the obvious question: Who is that madman?"

"Pleasance. Reverend Jared Pleasance."

She was silent while I explored the sphere and its contents. I could not see it all—the sphere was too large—but it was crammed remarkably full. The sheer volume of articles made me realize how much the church wanted the ship. And Pleasance was a good son of the church. I was sure his most pleasant dream was to kill Espa *and* retrieve the cargo.

"I've never met him," Espa said. "He has a reputation, though. A fanatic. A tool of the Disciples. Some friends tried to tell me he was the one who killed my father. But he is so young."

"How long have you been down here?"

"Since the explosion? A little over three months, I think. I was starting to think no one was coming to get me until I saw your ship. But then there was no radio contact, no attempt to talk to me. I got suspicious. Then I saw the man behind you with the laser."

She sat on the display case and looked up at me with this strange expression on her face. As if she wanted reassurance or me to tell her that everything would be all right.

Unfortunately, I was not sure that everything would be all right.

"It has been a lot longer than three months, outside. Pleasance is not a young man anymore. He is still a fanatic."

"What does he want? Can we bargain with him?"

"He does not want to bargain. He wants you dead." I quickly told her what Pleasance had told me, except that he had killed her father. I wanted her to know the danger, so she could help me, but I did not want her vengeful. Vengeance always excites the glands and dulls the brains. I needed her brains.

She came down from the display case, began to pace. She was just a little taller than I. I thought we could probably use each other's spacesuits.

"I do not understand him. I had a hard enough time understanding my father. I'm not very religious. Neither were most people my age. I really don't care what happens to the church."

"Fashions change in religion. Some generations are devout, some are not. Pleasance is very devout."

"Would he believe me if I told him I would go away, never contact anyone in the church? Most of my friends must be dead by now anyway."

"He would probably believe you. He would still kill you. Just to make sure. That seems to be the way he is built."

Espa picked up the Bow of Glenda, placed an arrow in the chamber. I reached over and grabbed her shoulder.

"What are you doing?" I asked.

"Let go of me."

I sighed and released her. I was in no shape for a fight, particularly with someone larger than I. I spoke again as she headed for the suit rack.

"It's no good, you know. He'll cut you down before you get into arrow range. Now that he knows what your armament is he'll come back equipped

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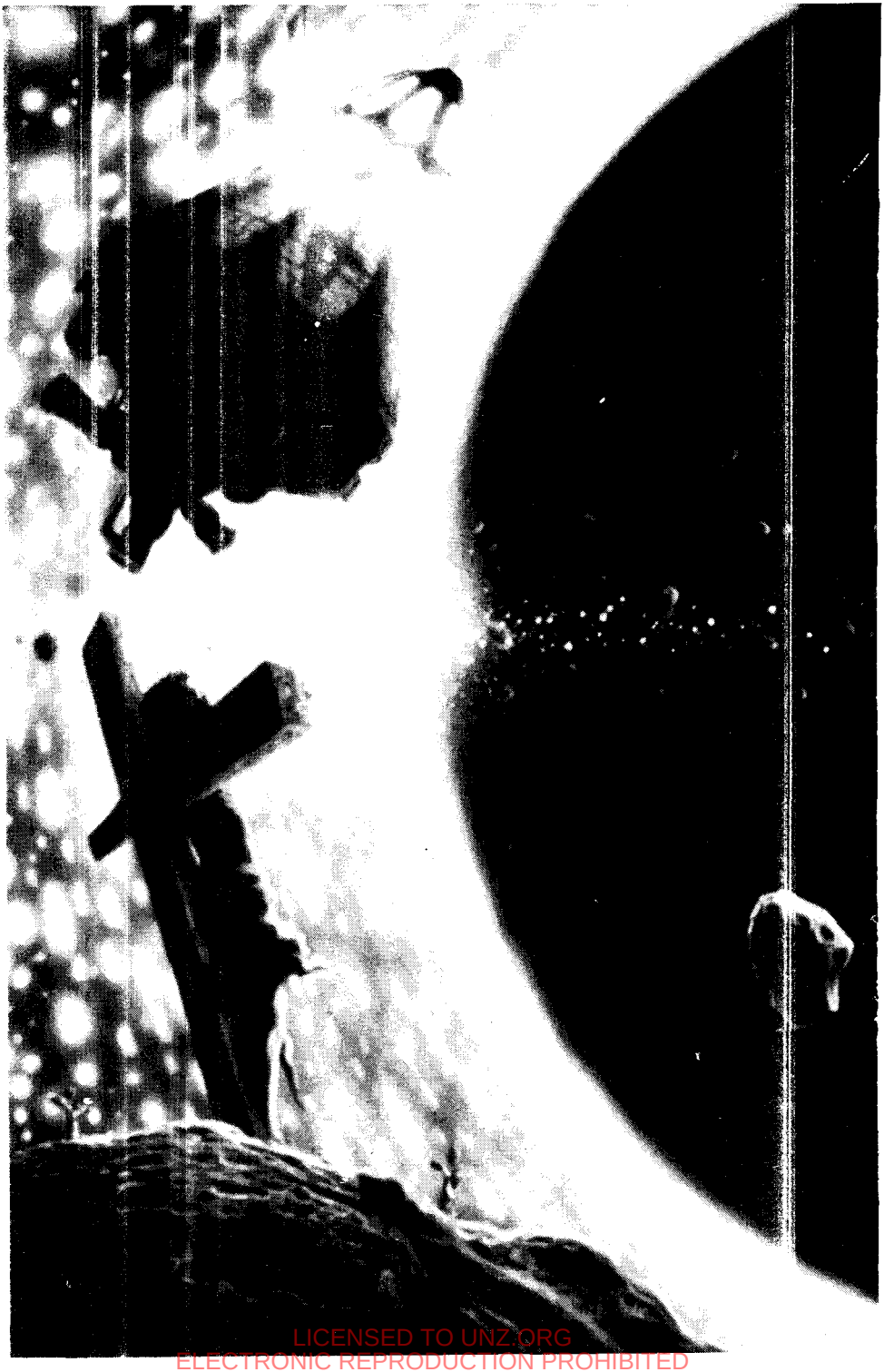

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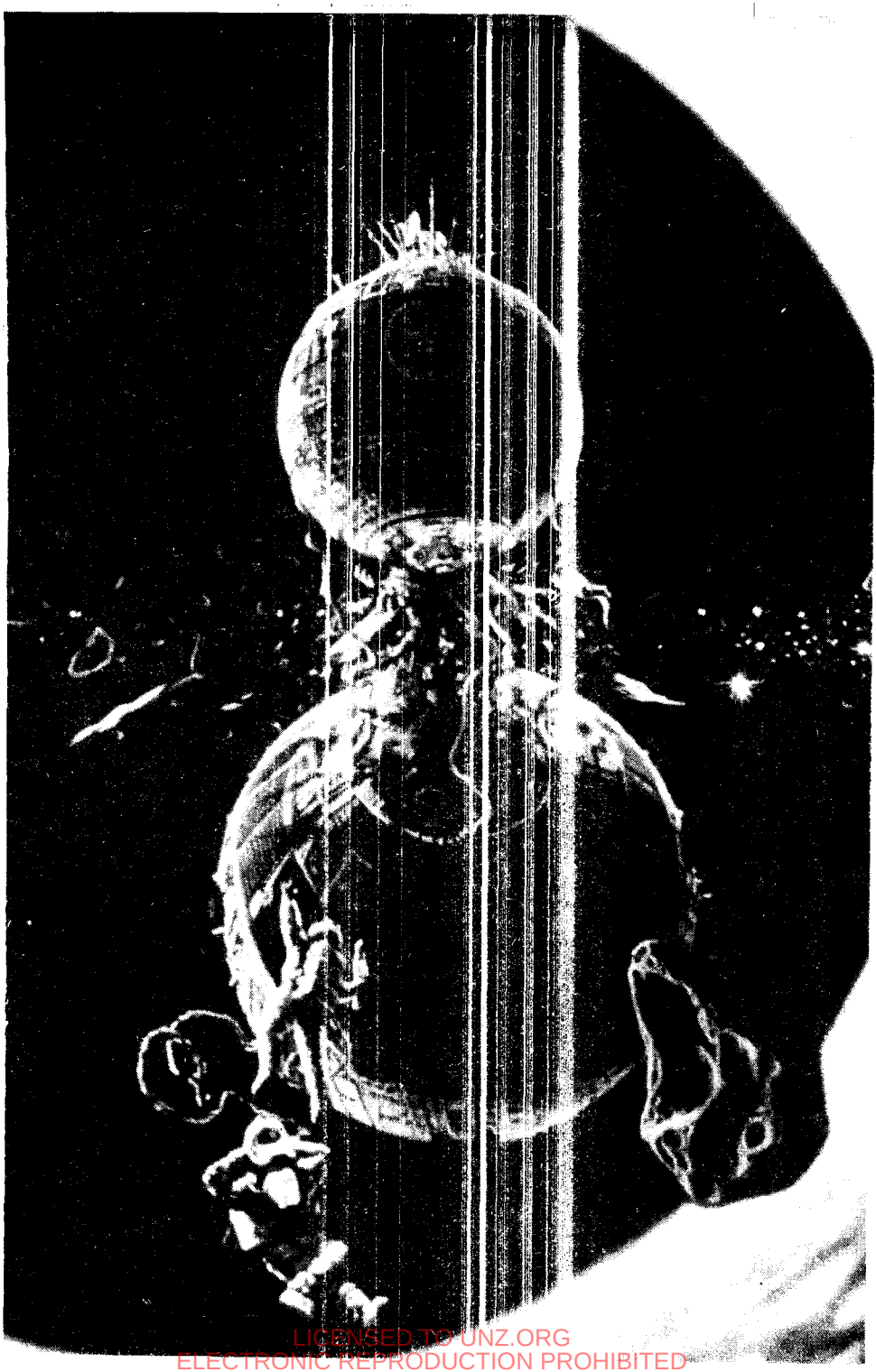

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so you can't hurt him. Then he'll find you and kill you. Then he'll kill me."

"If he had protection, why didn't he wear it the first time?"

"He had to assume you had a laser. What good is armor against a laser? It would have just slowed him down. Besides, he had me instead."

She had opened the suit rack and now hesitated. I nodded when I saw my suit, ripped and torn, next to two of hers.

"Do you have a better idea?" she demanded. She sounded hopeful.

Never dash someone's hopes, particularly when their plan is bound to get you killed. Of course I had a plan. And even if I didn't, I was bound to think of one sooner or later.

"Maybe. I need some information. Does the cargo hatch on this sphere work?"

She frowned. "I don't know. It should. The explosion didn't hurt much but the bar."

I sat for a few minutes and thought. I wished I had a computer simulation of Pleasance's mind, so I could program a result and see what I had to do to get that result. I understand they have developed such things, back at Earth, for use in the War Game.

Unfortunately, I was not on Earth. All I had to go on was my abbreviated acquaintance with the Reverend. The situation, however, was simple: I had enough information, or I did not. If I did, and Pleasance jumped through the hoops I was mentally constructing, then I had a chance. If I was wrong, if he was not quite the person I thought he was, we were dead.

I stood.

"We have work to do," I said. "He won't stay up there very much longer. We've got to be ready when he comes out again."

"Why are you smiling?" she asked.

"I always smile just before I bring the dead back to life. Come on."

* * *

Pleasance watched the wreck carefully while he healed. His weapons and suit were carefully laid out, the scanning computer in perfect condition. At the first sign of movement he was ready to leave the autodoc.

The autodoc beeped and withdrew into the wall. Pleasance flexed his fingers and moved his arm to make sure everything had healed properly. Then he fixed a meal and ate it. He wanted to be in top condition when he went back down.

The scanner sounded while he was finishing a leisurely second cup of coffee. He dropped the cup and checked the screen. Movement around the smaller sphere, something leaving the wreck.

He turned up the magnification until he could see the cargo hatch on the smaller sphere was open. As he watched, a crate passed through the hatch and struck the bar. The crate shattered and its cargo tumbled free. Some of it was caught in the wreckage; the rest tumbled into space in the general direction of the hole.

Pleasance pushed the magnification to maximum and focused on the contents of the crate. He swore, slowly and calmly. They were throwing the sacred articles into space.

Another crate passed through the hatch and sailed cleanly into space. Pleasance left the control board and put

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on his suit and weapons. He left the ship, locking it behind him.

He moved clumsily in space. The difficulty was obvious: instead of the usual flexible covering his suit was fitted with layer after overlapping layer of protective armor. He resembled nothing so much as an oversized turtle as he hovered before the smaller sphere and set his radio to transmit on all frequencies.

Before he could speak another crate left the sphere. This crate also missed the bar and disappeared behind the larger sphere.

"I have come to talk with you," Pleasance said. He waited calmly, confident in his armor.

Nothing happened for a few seconds. Pleasance repeated himself. He noticed motion in the corner of the hold. A suited figure appeared. Pleasance nodded to himself. Reinfeld. He recognized the suit.

"You are committing a great sin, Mr. Reinfeld. I would greatly appreciate it if you would stop."

Pleasance moved while he spoke. He drifted sideways, trying to locate the woman. She was the threat. Reinfeld was obviously unarmed.

"You are the one who has committed the sins, Reverend. Are you sure you want to commit more? Even God's forgiveness must know limits."

Reinfeld's voice sounded a little strange: tinny, and a faint echo. Pleasance shrugged it off. The suit had obviously been damaged. Besides, he thought he saw someone deeper in the hold. He moved again, slightly, to avoid frightening his quarry.

Reinfeld suddenly threw himself to the side. Another suit, maneuvering thrusters on full, burst from the hold behind him and headed for Pleasance.

Pleasance fired without moving. The suit jerked and burst into momentary flame.

The suit was empty. There was no body.

Pleasance reacted instantly. He twisted, tried to bring his weapon to bear behind him. For an instant he saw the space-suited figure behind him bearing down. For an instant he saw the welding torch, tip on full heat.

He was an instant late.

Sharlee swung the welder across Pleasance's arm. The armor resisted, then it flared and the welder cut smoothly through the material. Pleasance lost his arm and his weapon.

He screamed and reached for her. Sharlee shoved the welder toward him, trying to drive him away. He gripped it and lashed out with his legs. Sharlee felt herself thrust backward, tumbling. She was unarmed, out of control.

Pleasance drifted away, slowly rotating head over heels. He pawed at the welder, feebly trying to dislodge it. The welder clung to his chest like some greedy insect.

* * *

Pleasance fell away from us, toward the hole. He stopped struggling. I came out of hiding and waited for Sharlee to pick me up. From the noises I heard her making, I judged she was being sick.

I had been raised a Christian. While I watched Pleasance I found old memories suddenly fresh. I said a prayer for his soul and wished him good luck.

When we reached the ship, we found

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Pleasance had locked it and taken the key. It was not amusing to break into my own ship, but we did not have a choice. I tried to cause minimum damage but in the end had to burn a hole in the hull.

The decompression ruined most of the sealing, but we finally managed to make the control room airtight. I helped Sharlee clean herself and her suit, then gave her a sedative. While she slept I broke orbit and headed for the Station. After a few hours the image of the wreck split into a primary and a secondary. I did not look back after that.

We did not carry any of the religious objects back to the Station. I could use the money to repair my ship, and Sharlee was penniless, but neither of us wanted to go back to the wreck.

The ship's log showed that we had found the wreck and attempted to salvage it. In the process there had been an accident. Pleasance was killed and, per his last instructions, buried in the hole. All religious artifacts were lost. The caretaker had presumably been lost in the explosion that disabled the ship.

I tried to bring Sharlee up to date but I do not think it really hit her until the Station called us in modern Basic. Like I said, it sounds like a birdsong. It seemed to shock her even more when I replied in kind.

"It has been a long time," she said. She sounded subdued.

"You'll adjust," I said.

She stared at the screen I had focused on the Station. It was not until she spoke that I realized she was staring at the stars, not the Station.

"What's it like out there?"

"Like it always was. A little strange, a little terrible."

"What are you going to do now?"

I shrugged.

"Put the ship back together. Look for work."

"Could you use a partner?"

I had been afraid of this question all the way up. I had hoped she would not ask. I tried to be businesslike, to keep emotions out of the question.

"A partnership implies equality. I can bring us a ship. What have you got?"

She smiled. I admit to being a romantic, and it had been a long time since I had someone to talk with in English. I found myself hoping the smile was substance, not bluff.

"I kept one thing from the wreck. The photographs I took on the orbit down to the hole. According to the computer, the Hatane have restricted zones where prospecting is very expensive. Most of them are empty to discourage prospecting. I have photographs of several of those zones. Most of them are empty space. At least one contains something. From what I can tell, looks like an old ship. How much is that information worth?"

I thought for a moment. One ship, before my time, had made a strike in the restricted zone. The heirs of the backers now controlled a considerable percentage of the life-extension business.

"It will take a few weeks to get the word around. We'll want to hold an auction before we drop." ■

● The important thing is never to stop questioning.
Albert Einstein

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(Continued from page 49)
technologists have made. Plans for using food for alcohol fuel on a massive scale; crazy-quilt and short-term land- and water-use policies; closed interest, nationalist or elitist food production and distribution policies in both the developed and developing worlds; lack of concern for the possibilities of terrorist activity on world agriculture; and, most of all, the lack of world population control: all these things threaten the efficient and productive functioning of the kitchen staff of Spaceship Earth. And they are all command responsibilities.

But there is hope. Food is and can be plentiful enough to support many more people than are alive today. Agricultural science can and is buying some of the extra time necessary for restructuring human social, political, and economic systems into a viable entity. But the time thus bought is not unlimited.

Human ecology is completely dependent on ever-increasing production of food because of the ever-increasing population. Malthus in the long run is not mocked. If the galley of Spaceship Earth is to be kept full in the coming decades and throughout the 21st century, all of the scientific miracles in genetic engineering of plants—and more—will be required. But science alone is not and cannot be the savior; nor is it the villain if disaster comes.

Sooner or later, unless the passengers and crew of Spaceship Earth pay closer heed to where and how they get their food, all the scientific triumphs in the world will not suffice to keep the galley larders stocked in the coming century. ■

ABOUT THE AUTHOR

Dr. Mark S. Lesney received his B.S. in biology from Wayne State University and his M.S. and Ph.D., in plant pathology, from Michigan State University. Having had research articles published in professional journals, Lesney says, he now is attempting to establish himself as a freelance science and science-fiction writer. He is 27, a native Michigander who lives in Detroit.

● When a distinguished but elderly scientist states that something is possible, he is almost certainly right. When he states that something is impossible, he is very probably wrong.

Arthur C. Clarke

● When, however, the lay public rallies round an idea that is denounced by distinguished but elderly scientists and supports that idea with great fervor and emotion—the distinguished but elderly scientists are then, after all, probably right.

Isaac Asimov

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When I felt the pain in my upper left side and left arm, I knew I had to say goodbye.

The pain was severe and didn't stop, and punched through to the small of my back. I was afraid I wasn't going to have time. But the tablet under my tongue brought a measure of relief. After a long, painful time I leaned forward, heaved my tottery self to my feet. Old joints creak a lot. I panted for awhile, aware again that it wasn't just my heart that was old and worn out. I wanted to pick up the book I'd dropped beside the easy chair, but I didn't dare; I might, I thought, very easily fall and never be able to get up again.

Carefully I shuffled to the cabin's door, twisted the knob. It swung outward at a push and I stood in the doorway, panting, leaning against the jamb. In front of the cabin the little stream talked to itself loudly, and leaves swirled, fell, swirled again, but nothing else moved.

Appropriate, I thought, that it should come in the autumn. It gave my life a coherent, artistic whole, ending in fall

In honor of Clifford Simak

WALK WITH ME

Rob Chilson

All of us are subject to rules imposed from without

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what began in spring. A man who's outlived his wife and one of his kids has had summer and winter. . . .

Movement came easier now, or maybe it was the cool, fall-odored air that drew me out on the sagging porch. I looked around, but saw nothing. The trees stood about the cabin on three sides, including the creek side. It turned its back on the corner of the overgrown, unplowed field beside which came the rutted road that linked me with civilization. But even my car faced the woods, the car I'd never use again.

He had to be near. He had to be. It was impossible that he shouldn't be here on this day of my life.

I stepped down onto the yard, started across its patchy brown-dirt and goldgrass tapestry, wandering uncertainly as an old man's memories.

A deer came out of the forest downstream.

A doe, a big doe, big as a buck. I'd have to caution him about that. Then I remembered it didn't matter any more.

She slanted her ears at me and raised her head, lowered it, raised it again—perfect picture of caution and curiosity. Now she stamped and flicked

—but ultimately each of us is solely responsible for his own decisions.

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her whisk-broom tail at flies—but only I was close enough to note that there were no flies. I crossed the yard slowly, not to scare her off, and for my joints and the pain. My left arm didn't move well, so I just let it hang.

We were maybe one jump apart and she leaned toward me, started back, leaned toward me again. I grinned. It was perfect; a half-tame deer and a tottery old man who'd probably fed her salt. Or sugar. Or both.

"Farewell, old friend," I said. "It's been a long time."

It had been a long time.

I first met him years ago, outside the bar where I had just quarreled for what turned out to be the last time with the woman who didn't become my second wife. We were a pretty sullen party, me being the most sullen of the lot, and I could see that nothing would be gained if she and I got into a car together. All of a sudden I was just overpoweringly weary of it all, and in the end I never remarried or seriously thought of it. But at the time all I did was to say something like, "Look, I'm sorry for everything. But maybe you folks had better drop Sue off, if she doesn't mind."

She clearly didn't mind, and they saw that. "If it's no trouble to you," I added.

It was a relief to them. Well, we'd ruined their evening. So they all turned and went to the right, and I went off to the left, toward my own car. And past the entrance to the alley that Sue and I had passed on our way to the bar.

Not a dark alley. The streets just there are pretty narrow, and across from it was a big neon in yellow, and a display window lit up in stark white fluorescent light. Despite the way I felt, I caught the hint of motion out of the corner of my eye and whirled to look into the alley. Maybe walking along with my head hanging, looking at the pavement, had something to do with catching the movement.

Nothing there but two trash cans, like Tweedledum and Tweedledee.

But on the way *in*, the alley had been as well lit, and there had been only one.

Okay. I was maudlin and more than a little drunk. And I had just happened to glance in there for maybe half a second, walking toward the bar, and it was pure chance I happened to remember. And sure, I know the human mind can play tricks on itself. I should know; it's happened to me often enough.

But not this time.

I stood there and stared at the impossible trash can for quite a while. My memory was even sharp enough to tell me which of them was the ringer: the one nearest the alley mouth. For it had to be a ringer. No one in his right mind would set out a loaded trash can this late in the evening. If they did, they wouldn't lug it all the way up to the alley mouth; they'd set it out by their door.

I remember I put my hands on my hips in what must have seemed a drunken manner. I was prepared to demand that the trash can stand and deliver up its secret. Was it put out by the owner of the printshop the first can came from? No, I decided belligerently. That establishment was locked and dark when we went by, and was still locked and dark.

I opened my mouth to make some cutting remark to the can, and stood there with it open while a whole series

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of flash images went through my mind.

The thing that drew my attention to this can was that I'd thought I'd seen it *move*, just as I passed the alley mouth. But I was familiar with that phenomenon. Where I parked at work was just a paved lot, and the back of the building next to it frequently had a smallish, dun-colored packing crate beside its back door. Frequently. Not always. And about once a week I could swear I'd seen it move, just a fraction of an inch, as I rounded the corner into the lot.

As if it were just *moving into place*.

As this can had moved.

Preposterous. Just the paranoid thing a half-drunk would think, who'd just broken up with a woman he'd thought he'd loved, who maybe he did still love a little.

But I remembered a pile of leaves, that had also jerked a little. And a child's home-made scooter, a box on a toy wagon. And a discarded wheel with tire in a vacant lot. And— At that moment I knew with cold certainty that I was neither drunk nor crazy, that I was being followed by something or someone—maybe a whole organization of them—dogging me, spying on me.

I was too drunk for fear at first. "Hello, friend," I said, stepping toward it. "I believe we've met before."

A day or two later I had nearly shaken off the incident. One thing that contributed to the killing of it was the packing crate at work. I saw it two days later and went over, feeling foolish, and looked at it. It was just what it looked like, a smallish crate, quite empty, with some firm's name stenciled on it and a place where a bill of lading had been stuck to it. Well, I thought, I hadn't realized how much I'd had to drink. I'd talked our affair out with Sue, and that was closed, so I was reasonably level-headed, except for the loneliness.

But the next day, eating alone and doing more than a little brooding, I saw the Man in Blue.

I'd seen him many times before. Especially this last year. He was a good-sized man but not big, and he was wearing a rumpled blue suit. His face was large and rumpled too, and it was as blank and listless as my own must have been. I'd seen him, or someone just like him, two or three days a week in that little restaurant for at least a month. Before that I couldn't remember—he was hard to remember, he was so ordinary.

And I'd seen him here and there, in other clothes—workmen's uniforms, usually blue, always rumpled, and always with some variation of that large, sad, rumpled face. My hair tried to stand up and in the heat of the place my hands shook and goosebumps rose up on my back. For this was *him*. Or one of them. And I *knew* I was being followed, knew it beyond all possibility of doubt.

It was too sudden for me to be as afraid as I should have been. I started eating fast, to be through when he was, then I remembered I didn't need to; he'd finish when I did. After a moment I was even calm enough to ponder the possibility that, sober, I must be stark crazy. I came to no conclusion, but shrugged it off. I meant to have a word with that jay, crazy, drunk, or whatever.

The trash can hadn't answered me, of course. I had taken a step toward it with the intention of lifting its lid and

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looking inside, but hesitated, feeling the first chill of fear. Then I'd realized how I looked—standing there in bright light, talking to a perfectly ordinary trash can. So I'd turned and walked away.

The Man in Blue followed me out, shuffling aimlessly. I stopped and spun about and we were face to face.

Close up, his face wasn't so much sad, I saw, as blank, expressionless.

"Greetings again, friend."

"What? Who are you?"

His confusion made me bold. "You know me—Ira Webster," I said, and would have gone on, but he said, "I never heard of you. I'm George Jeffries, I live at—" He gave an address I don't remember, didn't remember at the time. "I think you're crazy," he concluded, and turned around and walked rapidly away.

I couldn't just stand there staring, people would notice, so after a moment I went slowly back to the office.

He hadn't convinced me. On the contrary, I knew he was following me. A real man wouldn't have rattled off his name and address like that, and he wouldn't have turned and walked off. He'd have brushed past me and gone on the way he was going. But a fake man would have a fake name and address as part of his cover, and that would be so much on the top of his mind that if he got a little rattled, out it would come.

I cussed myself a little for not having caught the address. Then I reflected that it wasn't really a clue, they wouldn't hand out clues; it was just a dead-end. I'd waste my time checking it out if I had it. Nevertheless, if I had it I'd check it out.

Not until later that afternoon, fiddling around desultorily with layouts, did it really hit me that I was thinking about a nonhuman being, an organization of nonhuman beings. Aliens from Mars, or wherever; I didn't know much about astronomy. (In those days people still thought there might be intelligent life on Mars.)

But it had to be. No human spy or detective could disguise himself as a trash can or a packing crate; you'd have to be Plastic Man. Scratch the packing crate, I thought; it was empty and light enough to pick up with one hand, while the Man in Blue was no lightweight. Wait a minute, maybe that was a real packing crate and They, or He, only pretended to be one when there wasn't a real one there. I put the packing crate back into the column.

Then I veered off, wondering, why me?

I'm nobody in particular. Nobody who'd attract the attention of a potential invader, certainly. Ten years ago it was different: I might just barely have seemed important then. I was assistant editor on a large city newspaper, and slated to come up fast—if I had what it took. I still don't know if I did. But Catherine died, and the kids reached college age and the ability to support themselves and pay for schooling too. So I said the hell with it and moved out to Riverview, getting a job on the local daily. Associate editor by now, with my big-city experience. But there was nothing about me to attract anyone's attention—invader or whatever.

At least, nothing that I could see. An alien being, with alien perceptions, might have different reasons for observing a human being. He might find

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me fascinating for some alien reason I could never understand.

I thought about it quite a bit that day and the next, and didn't earn my pay, but this was a low-key enterprise by big-city standards and nobody minded, if they noticed. I really didn't have enough information, but it seemed to me that if He or They were watching me for incomprehensible reasons, it probably didn't mean invasion.

I never thought of going to the authorities, or telling anyone. They'd just say I was crazy. I didn't have a lick of proof. This worried me a lot. I had no proof They weren't planning to invade. I lay awake a night or two, trying to put my Plastic Man aliens together with saucers and various other unexplained things—newspaper men hear more such things than you'd ever believe. But I couldn't find any pattern.

Two or three days later, in the afternoon, I was sitting in the back yard. I had bought a house in Riverview, out of habit, I suppose. I don't remember what I'd gone out there to do, yard work I suppose. I either did it or I didn't, and then I sat in the shade and rested. It was one of those gorgeous early summer days, hot but not yet suffocatingly so, and I sat there and felt good yet sad. For the first time I thought of the planet, Earth, as a planet and a place to live, and I saw, as if for the first time, that it was a good place to live. How long would it remain ours?

Although, sitting here in the golden warmth of Mankind's planet, it was hard to believe in the existence of Them. I'd had trouble maintaining that belief before.

If I hadn't been thinking of Them I'd never have noticed when the Shaggy Dog came blundering into the yard and seemed surprised to see me.

He looked like a bad imitation of an Old English Sheep Dog, only not so much hair over his face. He lived two, or three, or four houses down—I'd seen him around the neighborhood for about a year now. Well, I'd only been here a little more than a year myself. He'd always been alone, but well-behaved, self-sufficient, businesslike—if a little clumsy.

There was a dog a lot like him that hung out near work. Associated in some way with the restaurant where I ate. Or the bar where the others on the paper drank.

Wait a minute, I thought.

I got up, so fast I surprised myself, and therefore was able to corner the Dog in the angle of one neighbor's fence and my garage. It hesitated, looked past me on both sides, and seemed ready to bowl me over to get away.

It was as big as I.

"You're about as good an imitation of a dog as you are of a man," I said softly, my arms spread a little in case it jumped past me. "But of course that's apparent only to other dogs. That's why you're always alone. You sure had me fooled, as a dog."

It swung its head from side to side, its pantings suggesting a dog in some desperation, though not actually afraid. In a moment it would begin whining a little with each breath. It would take a keen-eyed dog fancier to recognize the disguise for what it was. It was pure dog to me and I was feeling a little foolish, despite my firm tone.

"No point in going on with it. I know

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who you are. Or what you are. I'll be able to spot you now, no matter what disguise you wear. You've been following me for a year now. At least a year."

It was watching me, listening; as a dog will watch and listen to a man who speaks to it.

"Maybe longer. In fact," I thought, with a sudden leap of insight, back to the time when I was an up-and-coming man on a major newspaper, "maybe ten years."

The Dog sat down, giving up, as a dog might. "Longer than that," it said. "Much longer than that."

Its voice was quiet, similar to "George Jeffries's," totally human, and very matter-of-fact.

My knees shook and the backs of my hands prickled; there was an all-gone feeling in my belly. My first impulse was to croak, "You talk!" or something equally profound, but I choked it down and managed an almost normal tone.

"Longer! How much longer?"

"I picked your mother out, before you were born—a month before you were born." His eyes were brown and doglike and sincere behind the hair—utterly Earthly. "I was there when Dr. Hardin delivered you. Remember him? He came out to the house. In those days, doctors came."

He picked her out! Wonder what old Doc Hardin would've said. . . . "So you were there. You've dogged me all my life. Why? And why me?"

He winced at the pun and gave an apologetic wag of his tail. "You realize that all of this is Strictly Restricted stuff, not to be revealed, to you or any human? You seem to know I'm not human—you said you know what I am."

"Yes. In general, not in particular. You're a—nonhuman being, an alien from another planet." I felt like a fool saying it out loud. "Spying, or something. I can't imagine any real spy wasting his time on me—from a pup up!" The thought still astounded me.

He winced again. "Studying you. You are my *project*, Ira."

I turned around and went back to the lawn chair I had been sitting in and sat down again. My knees were shaky. I cleared my throat.

"Your *project?*"

The Dog followed me over and sat down again, acting just as a real dog would have done. "Yes. It's part of my training."

I sat and absorbed that for awhile. Training that took at least two thirds of a man's life? No, this was only *part* of his training.

"What are you training to be?"

"You don't have the word. An investigator, perhaps. A biologist. A student of life. I hope to study new races, learn of their ways, their beliefs, their modes of thought."

"An anthropologist. No—culturologist is better, if there is such a word. So you're studying me—us?"

"Not at all. You have been studied. Besides, Earth is an ordinary place. There is nothing new, strange, or extraordinary here. But it makes a good training ground. I was even your dog once. From a pup up, you said. Remember Winky?"

I nodded, speechless. I could never forget Winky—

"My counselor made me end it; too much chance of interference."

I had learned so much in so short a

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time I could only sit taking it in. The Dog made an ingratiating wiggle and said, "Look, Ira, you won't tell anyone, will you? There'd be an awful stink if this got out. Cultures of your type, at your current level, aren't permitted to know of the existence of other cultures—especially of what might be called superior cultures by your own standards."

"Why not?" I said, jolted. A newspaperman sees and hears more of the bad side of human beings— "Why not let us know of superior ways of doing things?"

"Because it would make you feel inferior. Besides, *we* don't decide which is superior. We can't. But there are cultures that *you'd* call superior—cultures without war, cultures without crime. Knowledge of them wouldn't help you; you aren't ready yet to apply their methods, and you'd feel worse—and act worse."

I've known people who only got worse, the better your advice. Most kids are like that. And the human race is pretty childish. I nodded slowly.

"Are you from one of those cultures?" I asked, somewhat resentfully.

"Yes and no. Not exactly. Look, a hundred years ago medicine was in such a state you could practically say they had no medicine by your current standards. Yet they had medicine of a sort, better than nothing. You have merely advanced farther. And we have advanced farther in the direction of criminology than you, but we still have crime. I'm pleading with you to compound a felony right now."

"A felony, huh?" I realized the Dog was giving it to me in human terms, that this could only be a loose approximation. "You'd flunk the course if I blabbed?"

"Worse than that. I might be liable for damages. Ira, a lot of time and money has been spent on Earth. It could cost us one of our best training grounds, and they might come down on me for that. We talk a great game of Galactic civilization, but we're not complete altruists. As Mark Twain remarked, it hurts less when you've gotten even."

"What do *we* get out of it? Does your altruism extend to helping out people? Or do you just stand around like ghouls at an accident and watch?"

"We don't interfere. Your destiny is your own. That extends to the personal, too; your individual destiny is your own."

"You just watch." Still resentful.

"That's right: I just watch. Ira, you won't tell?"

"I'll have to think it over. Give me a couple of days. It seems unfair that we don't get anything out of it."

"All right. I'll be seeing you."

I couldn't help grinning at his joke, and the Dog went "Whauff!" grinning back at me, and bounced away, tail wagging, for all the world just like a real dog.

I did some heavy thinking next day, which was Friday, and most of the weekend. I still didn't have any proof, but as long as he was watching me I could spot him. If necessary, a bullet through that Plastic Man body would probably provide all the proof I'd need, especially with witnesses. But could I bring myself to kill a fellow "man"? And if I did kill him, how could I ar-

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range for any kind of help for the human race? Were there ever any exceptions to their noninterference?

If Earth was a valuable training ground, maybe they'd be willing to make a very minor exception, helping us in inconspicuous ways. I could maybe give them some advice there. And if they knew us as well as the Dog implied, they might need no advice from me. They might very well need no advice.

Finally I realized I didn't have enough information to come to any decision. But since it looked as if we were going to blow up our world, surely they'd do *something*.

I was a little puzzled how to get in touch at first. I wasn't going to start talking to trash cans and packing crates in public, and I doubted if I'd see the Man in Blue again. Certainly I didn't want to; he made me uncomfortable. Then I realized that the Observer was at too great a distance to follow my career. So my house must be bugged from stem to gudgeon.

Clearing my throat, I said, "Observer, I want to speak to you this afternoon. In the back yard. Come as a dog, please." I felt like a fool, and sillier still when there was no answer.

But that afternoon the Dog lolloped out of the bushes and pattered up, to sit and pant, grinning, at me.

All afternoon I'd been thinking about the Man in Blue. "What's your real shape?" I asked. "Are you from a race chosen specially to be culturologists because of your shape-shifting ability?"

"Not at all. This isn't me that you're looking at. I breathe oxygen, but I can't take your atmosphere. This is a construct, a robot. It isn't programmed to take my shape. Think of a large furry arrowhead with four legs along each edge, swimming through water. I'm asleep in my own tub at home, with implants hooking me to this robot, so I feel as if I am sitting in front of you, beating my tail in the dust. You don't water your lawn enough."

"So it can only take a few, prearranged shapes?"

"Complex shapes such as living beings, yes. It's complete to the bones and internal organs, though there are differences in the cells. Inanimate objects, such as boxes or what have you, can be duplicated externally. Of course the deception wouldn't fool a child who investigates it. We are warned not to use such disguises around children."

"You know us well. Listen, Dog, I've thought it over and I can't let my people suffer and maybe die when I could maybe get help for them by hollering cop. Can you arrange help for us? At least enough to keep us from blowing ourselves up. After all, that'd cost you your training ground."

He was silent for a long moment. "No, Ira, I cannot. I am only a minor student in his first term. And Earth is convenient, but not indispensable. It's a perfectly ordinary planet with a perfectly ordinary people. Much like us, to tell the truth. It could be replaced without too much trouble."

The other day he had said a lot of money and time had been spent. Yet I knew what he meant. The Galaxy, or whatever organization he served, might take it out on *him* if he blew their cover here, but that wouldn't oblige it to spend a penny on *us*. And if their training ground required the inhabitants to be

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ignorant of the existence of the Observers—I could see why it did—helping us would tend to compromise that. Even if I promised on my soul to keep my mouth shut. Bureaucrats are probably the same everywhere, I mused.

"So the most I can do is get you in trouble and maybe cause you to abandon Earth as a training ground. Damn it, Dog, *why* won't the Galaxy help deserving races? Or aren't we deserving?"

"You're not. Ira, this case has come up before. Many students come to identify with their subjects. Empathy is our function, after all. So it is impressed on every first-term student that Earth is not eligible for aid." He sat looking at me for a moment, and if dogs smile slightly, that one did.

"We only give our aid to people who need it."

IN TIMES TO COME

To people who've grown up with a technology based on machines of metal and glass and plastic, it's easy to look longingly at such elusive phenomena as telepathy and telekinesis and wonder what life would be like if those things were available as everyday tools. Chances are that it would be radically different: those skills, which look like magic to us, would replace many of the mechanical devices of daily life (though if such a culture happened to develop from one like ours, it would probably retain some of those mechanisms to do certain jobs). What is easy for us to overlook is that the psi techniques in such a culture would be its everyday tools, as subject to limitations as ours and viewed just as matter-of-factly by its people. But would such a civilization find its different orientation an asset or a liability—or both? Marc Stiegler considers the question in next month's cover story, "Too Loving a Touch."

If the pieces fit together right, we should also have a speculative fact article on "Alien Sex"—not our attempt to compete with Certain Other Magazines, but another in our continuing series of thought pieces on exobiology by Dr. Robert A. Freitas, Jr. Plus, quite possibly, our first "State of the Art" article in quite a while (by Joe Patrouch), and assorted stories by such writers as Spider Robinson.

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In the years following I saw much of Observer. Indeed, he became one of my closest friends. We met several times a year and went out to eat, where he got practice in the minutia of acting human. He told me proudly that he had the highest grade in mimicry in his section of his class.

"I owe it all to you, Ira," he told me. "I'm not the best student, to tell the truth."

I got so I could usually pick him out, no matter what shape he came in. I nearly gave up coon hunting, though, for fear he'd get hurt. But Observer said he could take care of himself, and in talking of them, he seemed to enjoy the hunts. He must have joined in as a dog, and I wonder what the hounds thought of him.

Much as he may have enjoyed the hunting from his own point of view, Observer was puzzled by what I and the other boys got out of it. He had to figure it all out and put it in his thesis.

There was a lot that puzzled him, but he wouldn't let me tell him. That was too much like looking in the back of the book for the answers. Once when he confessed he didn't know if he was going to pass this term or not, I offered to explain to him in detail just why I gave up the newspaper job in Riverview and moved to Millville, where I'd bought out Amos Carter, the old printer.

He was torn. You could see he was torn. But he said, "No, Ira, that would not be right. I have to figure all this out on my own. How else will I learn?"

So I let him sweat it out.

When men landed on the Moon I hoped—almost expected—that the Observers would make themselves known to us. But they didn't, and I can see that they were right. So I reconciled myself to the situation, more or less, Besides, Observer'd said we didn't need any help, so I tried not to worry about the human race.

Still, how could I help but worry—and chafe over knowing that help was with us, if only they would—well. But I'd lay awake long into the night, though I never mentioned the subject to Observer after that first time.

It was he who came to me.

I had retired and bought this small cabin, where I fish, and putter around, and just sit and look out into the woods a lot, and sometimes visit or am visited by my grandkids.

He came day before yesterday, dressed as the Man in Blue. Since I retired he's usually come as some animal. His years of experience in mimicry made his face human, his expressions perfect.

"Ira, I've come to a decision," he said solemnly.

"Yes?"

"You know my term here is ending. You're smart enough to figure that it's based pretty closely on your own life. I'll have to finish my thesis and pass various other tests, but this is basically the end of the term for me."

"I thought as much. Well, it's about the end of the term for me, too; it could be any time, or not for several years. Been nice knowing you, Observer."

"And it's been nice knowing you, too, Ira. Ira, I want you to know that I'm going to pass. Thanks to you. I'm not the best student, and I know now that I'm not fitted for culturology. I

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didn't do too well here on Earth, and that's a highly similar culture. So I'd never make it as a culturologist."

"I hope your time here wasn't wasted?"

"No, you're right; it wasn't. Culturology will always be my first love. I could make a good—what you'd call a science reporter. Or an Independent Investigator of research bureaus. I'll make out. And I'm going to pass! I say that because I want you of all people to know that what I've decided to do isn't done out of what you call sour grapes—what we call salt water. I'd do it if I was the best in my class. So would plenty others, if they had the nerve."

I'd begun to understand. "What is it you're going to do?"

"I'm going to help out the human race."

We looked at each other for a long time.

"They'll break you," I said. "They'll ruin you. The whole university system will be closed to you—"

"They'll do all of that, if they catch me. I'm going to do it in a roundabout way that will be difficult to trace. But I've got less than a fifty-fifty chance of pulling it off, by my calculations. Still and all, I have to do it."

"Why?" I asked, upset. And here it was—much as I'd wanted help for my people, could I ask anyone to make such a sacrifice? "You've said we don't really need help—"

"You will survive; you are good people, you human guys. But that will come later. *Now*, you are suffering. *Now*, you are troubled and mad and at each others' throats. How can I go about my business and let my good friends—you and others

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I've come to know—continue to suffer? It wouldn't be human, Ira, and I am human. In all my shapes I'm human; and so are you in *your* funny shape."

"They'll sue you for your back teeth. They'll—"

"I don't care *what* they do! The subject is closed, Ira."

I sat and looked at him for a while. "Well," I said. "Well. Thank you, Dog. You're the best friend I ever had. I can't say more than that except thank you again."

Observer has told me what he's doing. He's releasing a sort of philosophy of psychology that applies to his and our type of minds. Use of it can tell us much about ourselves, empty asylums and penitentiaries, help us to restructure our societies, and many other things. Only if it is properly applied, though, and that will take much hard work. War and crime and the like won't be ended immediately or as a matter of course; but the power to end them will be put in our hands. If we use it.

Well, we can't ask more than that.

I've written all this down because I know that whatever happens, I won't live to see it. Maybe even—I still have this hope—if this philosophy sets us forward hundreds of years—maybe we'll be judged ready for contact. Maybe my grandchildren will be there.

I'm going to ask Observer to take care of this when I die. When contact is made, he'll see that it's delivered to my heirs—or if it's been too long, maybe to the whole human race. The race for which he was willing to sacrifice so much.

"Put your arm over my back," said the Deer, "and I will help you back to the house."

"Good luck with your thesis," I gasped.

"Never mind my thesis, Ira! Come on."

I turned stiffly, the pain coming on me again, and sort of draped myself over Observer's back. We went very slowly, and I couldn't reach up with my left arm to brush away the tears. Not tears of pain. Tears of joy.

A true friend is more to be valued than fine gold. And they are all of them first of all our friends. Even if nobody but I ever knows that the Observers are there, and we benefit in no way by their presence, still it is good that there are those who walk beside us. ■

● Urban planning should be simply part of a much wider approach to the national territory as a whole. In a sense, a national plan is ecology practiced at the country level, a sorting out of habitats and environments, an understanding of special niches, a creative reaction to forces of dynamic change, a rejection of single-thrust development based upon a purely economic calculus, a search for patterns which satisfy a wider variety of human needs.

Barbara Ward and Rene Dubos

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The Alternate View: IN DEFENSE OF SPACE

G. Harry Stine

"The only way to justify long-term social programs is national defense."

Dr. Hans Mark, NASA's deputy administrator, said this in October 1981 and went on to explain what this meant to the space program and NASA.

"If we don't have a strong national defense, it won't make any difference whether we have a space program or not," he said.

I find it very difficult to disagree with him.

But do these statements, coming as they do from the Number Two man at NASA, mean our national space program is going to be taken over by the Department of Defense? After all, Mark is a former Secretary of the Air Force and has brought in USAF General Jim Abrahamson to run the space shuttle program. It certainly looks like it, doesn't it?

Don't jump to conclusions.

USAF General Sam Phillips was called in to save Apollo 15 years ago . . . and he did just that.

There's *always* been a close relationship between NASA and the Department of Defense, *even though most people weren't and aren't aware of it.*

This probably stems from the basic national space policy announced by President Dwight D. Eisenhower more than a quarter of a century ago: The United States would have *two* space programs—a military one, and a civilian one. And we've been operating with this fiction ever since because it *is* a fiction, historically and currently. There's never been a separation between military and civilian aerospace activities in the United States.

NASA's predecessor agency, the National Advisory Committee for Aeronautics (NACA) was formed in 1915 for the specific purpose of undertaking aeronautical research to provide the United States with superior military aircraft. World War I was blazing in Europe, and it was obvious to aeronautical pioneers in industry, the military, and Congress that the U.S.A. was far behind Europe in aviation. This became abundantly clear when the U.S.A. got into the conflict in 1917.

The United States did not produce one single military aircraft during World War I.

American aces—Rickenbacker, Luke, Lufberry, Vaughn, Springs, Kindley, Landis, Swaab, and Hunter—flew castoff French Spads and Nieuports.

NACA's function was to see to it that this didn't happen again by bringing American aeronautical research to the forefront. NACA did just that for more than 40 years.

And there was always one active NACA member from the United States

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naval aviation element and the United States Army Signal Corps Aviation Section/Air Corps/Air Forces and, finally, the United States Air Force itself.

The United States would not be the leading aeronautical nation in the world today without NACA. The Douglas DC-3 incorporated an incredible number of NACA discoveries—low-drag engine cowlings and airfoils, to mention but two. Without the DC-3 to spawn the DC-4, the airlines would have been forced to continue buying European airliners like the Fokker . . . and the United States would not have built the ocean-spanning aircraft that blazed the way for the American flag carriers in international air commerce today.

Dr. Theodore von Karman, one of the great scientists of the twentieth century, once commented on this close connection between military and commercial aviation: "So far as my participation with the military is concerned, my conviction is that even though the research and development is made for the military, the experience is evidenced in civil aviation."

I can't argue with that, either. I fly a Piper Cherokee whose safety and performance come from its NACA laminar-flow airfoil developed for fighter planes such as the P-51 Mustang. American jet airliners that dominate international air commerce use swept-wing aerodynamic principles developed for military aircraft; their jet engines are directly derived from military counterparts.

There's always been an intimate relationship between military and civil aerospace activities.

In the United States, we're still working with Eisenhower's dual space policy a quarter of a century old *that's fiction!* There's never been a separation between the Department of Defense space programs and NASA's programs. It just *seems* so because the national space policy demands that one portion of the nation's space activity must always operate with a television camera looking over its shoulder.

Of the first 73 NASA astronauts chosen, 60 were Air Force, Navy, or Marine pilots. The only civilian to have set foot on the Moon is Harrison H. Schmitt. In fact, only three civilian American astronauts have ever flown in space at all.

The Redstone, Thor, Atlas, and Titan ballistic missiles have become NASA space launch vehicles. The only NASA launch vehicle that isn't ostensibly a military rocket or derived *directly* from a military rocket is the NASA Scout. The Saturn-I and Saturn-Ib used Redstone and Jupiter tankage. The Saturn-V came directly from Saturn-I experience. The NASA space shuttle was sized and shaped because of DoD requirements.

This is why the U.S. space policy of separate military and civilian space programs was and is a fiction.

Time to blow the whistle on it and call a spade a spade.

The Soviet Union certainly doesn't labor under such a fictional dichotomy. They make no bones about it, even though at least 12 of their cosmonauts are not military people and even though they've flown at least four times as many nonmilitary cosmonauts as the U.S.A.

NASA's new priorities involve (a) getting the space shuttle operational,

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(b) working toward a permanent presence in space in the 1980 decade, and (c) increasing aeronautical research. Every other NASA program, including planetary research, falls into the fourth and last category—i.e., nice neat things to do if and when money is available to do them.

By the time you read this, the hue and cry will already have gone up from the planetary research advocates, complaining mightily about the hiatus in deep space research. I empathize with them. It would be neat to do a Halley's Comet mission. But the only justification for a Halley mission that will hold water with an administration that's trying to attack the problems of the national economy while building a stronger national defense can be national prestige. And the inevitable question arises, *Can we afford more national prestige right now?*

We *should* be doing more planetary research, but *not for the reasons currently espoused by the planetary researchers*. We should be doing planetary research to *find out what's out there that we can use*. I don't know of a single space scientist who pointed out that the discovery of nitrogen on Titan amounts to a major breakthrough because once we get human habitations in space, Titan's the best place in the solar system to obtain nitrogen, not the Earth at the bottom of a deep gravity well. Well, it looks like we're not going to get more of this sort of data, and it's not really clear that we'll be able to use it anyway unless we *do* get the shuttle working and a permanent presence in space established.

As for increased NASA aeronautical research, we need it desperately, and it's something that private enterprise cannot afford and will not do. That's why NACA was set up in the first place. Look at it this way: In 1979, which is the latest current data I have from the Federal Aviation Administration, 11.45 billion gallons of petroleum-based aviation fuel were consumed, more than 90% of this by the commercial airlines. By 1990, it's estimated that some 15 billion gallons of fuel will be consumed annually. When you count the number of holes that this fuel comes out of and compare it to the number of holes it goes into, it becomes obvious it can't go on forever. Not even at current prices for jet fuel, which is the primary reason why your last airline ticket put you into shock when you looked at the price.

We need that aeronautical research because both our national commerce and our national defense depend upon it. We need new, fuel-efficient engines. We need better low-drag airframes. Nearly all of the aerodynamic principles embodied in today's airplanes are now more than a quarter of a century old. Save for the super-critical airfoil, there's been damned little progress in aeronautics. We've overlooked it because of the glamor of space, but our presence in space depends upon strong and healthy aerospace and airline industries.

I'm reminded of this every time I fly. My airplane, which costs less than a new car now, uses World War II technology—aerodynamics, airframe, engine, avionics. True, I fly it for less cost than an airline ticket. But it could be better and cheaper. Some people like Bert Rutan are proving this.

We need sophisticated aeronautical

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research that will lead toward more efficient engines, aerodynamics, and electronics . . . which in turn will lead toward better automobiles, because *there* is a primitive industry that could profit from such research. The aerodynamic qualities of nearly every automobile except the French Citroen are downright lousy.

Very well, we're going to have a whole new ball game in NASA, one that's completely different, yet not so completely different. If we want to get into space, we'll have to play that game right now. In the next column we'll look at *why* we're going to need the military standing beside us when it comes to our permanent presence in space. The alternate view from that of the news media may surprise and astound you. ■

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a calendar of analog upcoming events

2 - 4 April
FOOL-CON V (Kansas-area SF conference) at Johnson County Community College, Overland Park, Kan. Guests of Honor—Robert Bloch, James P. Hogan, Alicia Austin. TM—Richard A. Lupoff. Registration—$9. Info: Jonathan Bacon, Johnson County Community College, 12345 College at Quivira, Overland Park KS 66210. 913-888-8500 ext 408/409.

9 - 12 April
CHANNELCON (1982 British National SF Convention) at Metropole Hotel, Brighton. Guests of Honour—John Sladek, Angela Carter. Info: Channelcon, 4 Fletcher Road, Chiswick, London. UK, W4 5AY (use airmail).

17 April
APRICON 4 at Columbia University, N.Y.C. Guest of Honor—Thomas M. Disch. Info: Barnard/Columbia Science Fiction Society, 317 Ferris Booth Hall, Columbia University, New York NY 10027.

14 - 18 April
Popular Culture Association meeting at Louisville, Ky. The Science Fiction Fantasy Area will be giving papers. For general information: Thomas Remington, Dept. of English, Univ. of Northern Iowa, Cedar Falls IA 50613.

16 - 18 April
HIGH PLAINS II (Texas regional SF conference) at Quality Inn, Amarillo, Tex. Registration $10. Info: High Plains II, 1206 W. 18th, Amarillo TX 79120.

26 - 29 April
General meeting of the American Physical Society at Washington, D.C. Info: A.P.S., 335 East 45th Street, New York, NY 10017.

30 April - 2 May
MARCON 17 (central Ohio-area SF conference) at the University Hilton Inn, Columbus, Ohio. Pro Guest of Honor—Hal Clement; Fan Guest of Honor—Buck Coulson; TM—Juanita Coulson. Registration—$12.50 until 1 April 1982, $15 at door. Hucksters, art show. Info: Marcon 17, P.O. Box 2583, Columbus OH 43216. 614-497-9953. Note: no banquet this year.

27 June - 7 August
CLARION Workshop in Science Fiction and Fantasy Writing, Michigan State University. Writers in residence will be Algis Budrys, Marta Randall, Samuel R. Delany, Orson Scott Card, Kate Wilhelm, and Damon Knight. Address inquiries *immediately* to Dr. Leonard Isaacs, Lyman Briggs School, Michigan State University, East Lansing MI 48824.

27 June - 2 July
JERUCON (First International Integrative Congress on Science Fiction, Fantasy, and Speculative Science). Many world-famous SF authors will be in attendance. Info: Organizing Secretariat, Jerucon 82, P.O. Box 394, Tel Aviv 61003, Israel. (Use airmail.)

2 - 6 September
CHICON IV (40th World Science Fiction Convention) at Hyatt Regency Chicago Hotel, Chicago, Ill. Guest of Honor—A. Bertram Chandler; Artist Guest of Honor—Frank Kelly Freas; Fan Guest of Honor—Lee Hoffman. Registration—$15 supporting at all times. Attending—$50 until 15 June 1982. This is the SF universe's annual get-together. Professionals and readers from all over the world will be in attendance. Talks, panels, films, fancy dress competition, the works. Join now and get to nominate and vote for the Hugo awards and the John W. Campbell Award for Best New Writer. Info: Chicon IV, Box A3120, Chicago IL 60690.

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"Tradition is a set of solutions for which we have forgotten the problems. All societies use them — and wise societies can modify them when the problems change.

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SYNOPSIS

Seven times a day He passes overhead. In the religion of the Race it is **The God of the Sky** *who long ago carried sacred life to the profane planet Geta to save the Race from the Unknown Danger. God has since chosen silence so that the Race might learn from its own acts. All knowledge is subservient to biology. All leaders are biologist-priests. All religion stems from genetics which alone is able to guide survival on a world deliberately chosen by God to be harsh enough to breed the kind of "kalothi" needed to master the Unknown Danger.*

Clans dominate the life of Geta. Non-territorial underclans breed themselves to perform defined services. Territorial priest clans control biology and rule, vying with each other to fulfill the Chant which predicts that one clan will unite all of Geta. In the region of the Wailing Mountains it is the Kaiel priests who rule.

The maran-Kaiel family, which consists of the brother-husbands **Gaet, Hoemei,** *and* **Joesai,** *and their co-wives* **Noe** *and* **Teenae,** *are courting* **Kathein** *so that they may transform their marriage into a complete Six. Kathein is a physicist whose main effort has been directed to the extraction of information from a single crystal which has come to be known as the Frozen Voice of God.*

The clan leader of the Kaiel, Prime Predictor **Aesoe,** *disapproves of this match, coveting Kathein himself, and insists that the maran Five, who are subject to his will, marry instead the powerful but clanless heretic* **Oelita** *from the coast even though she is an atheist. The coast is ruled by the Stgal, and charismatic Oelita is their most powerful enemy. Political advantages would accrue to the Kaiel by making an alliance with those opposed to the Stgal. Oelita is called the Gentle Heretic because she does not believe in violence and abhors the system by which the priest clans call up the low in "kalothi" to be eaten during times of famine. She is unaware of Aesoe's plans for her.*

In defiance of Aesoe, the maran send Joesai from the city of Kaiel-hontokae down through the Valley of Ten Thousand Graves to the coast to challenge Oelita by the Seven Trials of the Death Rite, hoping to kill her so that they will not have to marry her. Teenae is sent with Joesai to balance his violence and secretly schemes to carry out a less drastic plan of her own which will both give the maran Kathein and give the Kaiel strategic advantage on the coast. Teenae befriends Oelita and discovers that she, too, owns a Frozen Voice of God, but is unaware of its true nature.

Meanwhile the seagoing Mnankrei, eying the weak Stgal, covet the same coastline of the Njarae Sea as do the Kaiel. Their principal form of attack is a mutated profane beetle, the underjaw, which creates famine by eating the sacred wheat. Storm Master **Tonpa** *happens to be in the coastal port of Sorrow when Joesai tests Oelita. During the First Trial, which is an ordeal by drowning, Joesai hides behind false clues which cast all suspicion for this initial death trap upon the Mnankrei. Tonpa, furious, captures Teenae, tortures her, and exposes the Kaiel plans to Oelita for the deceit that they are—but only as a cover for his own deceit. He*

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burns Sorrow's main granary to aggravate the coming famine so that the Stgal will be forced to buy Mnankrei wheat and accept Mnankrei rule. Blame for the disaster is cleverly cast upon the Kaiel. Joesai awards a Second Trial to Oelita in gratitude for her bravery in saving Teenae from Tonpa.

During the granary fire, Teenae is wounded by an outraged resident of Sorrow and Joesai takes her away to safety. While Teenae recuperates Joesai sends the bulk of his men north to spy on the Mnankrei but returns himself to Sorrow to steal Oelita's Frozen Voice only to find the Gentle Heretic imprisoned by the Stgal. They are using the coming famine to eliminate the heretics who are being called up to donate their bodies to the food supply by Ritual Suicide. While rescuing Oelita, in an ordeal he names as Third Trial, Joesai makes off with her Frozen Voice. She humiliates him by recovering it, and demands that her daring be named Fourth Trial.

Later, with the aid of Gaet, who takes Oelita through her Fifth Trial over a vicious mountain called the White Wound, she brings the crystal to Kaielhontokae in the hopes of exchanging it for the relief of her people. She is adopted by Gaet and Hoemei and Noe and, when Teenae and Joesai arrive home, finds, to her horror, that all five comprise one family.

Aesoe makes an alliance with Oelita, giving Hoemei the task of writing the contract between the Kaiel and her people.

Hoemei has become more and more aware of the nature of the coming Mnankrei attack through his rayvoice spies. The Kaiel begin to organize a Gathering to strike out and destroy the Mnankrei before the biological sins of this clan make them too strong to stop. **Bendaien hosa-Kaiel** *is given the task of leading the Gathering but Aesoe, angered at Joesai for trying to kill Oelita and thereby recover Kathein, gives him the lethal job of leading the Advance Court.*

In another part of the city, the crone mother of the Liethe hive has brought in an assassin, **The se-Tufi Who Walks in Humility.** *The Liethe clan contains no males. They propagate their most desirable female lines by cloning. Aesoe "owns" three Liethe of the se-Tufi line—Honey, Cairnem, and Sieen—not knowing that these names are only personae. Humility is trained by the hive to assume any of the three personae. In the persona of Honey she seduces Hoemei and pulls from him the secret of the rayvoice.*

Kathein has begun to decode Oelita's crystal. It turns out to be an ancient history of the Race, recording events that took place before the Journey Across God's Sky, violent events of "war." War is unknown to the Getans because their society is organized along horizontal lines. Ruling priests of different clans cannot incite, say, farmers of the same clan to fight each other. Priests must conduct their own fights. The Forge of War, *as the document is named, shocks any Getan who reads it—killing more people than one can eat is not ethical. Joesai uses* The Forge of War *to challenge Oelita by Sixth Trial, an attack on her mind. She is an atheist but here is incontrovertible proof that*

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God exists. She goes mad and disappears.

Furious, Aesoe immediately sends Joesai upon his deadly mission against the Mnankrei. Noe follows as supply organizer. Hoemei orders Joesai to disobey Aesoe and stay outside of the Mnankrei city of Soebo, doing nothing. Idleness does not set well with Joesai, who is a man of action. He decides to pretend he is remaining outside the city while entering it covertly.

In the meantime Humility has been sent to Soebo. In Soebo she is trained by the crones there to take on the persona of Radiance, who is mistress of Winterstorm Master **Nie t'Fosal,** *and the persona of Comfort, who is mistress of the opposition leader, High Wave* **Ogar tu'Ama.** *As Radiance, Humility contracts to "poison" Joesai's camp with a bio-engineered disease. The Liethe are conducting their own purge of the Mnankrei, and have condemned t'Fosal to death by rite of the Lattice of Evidence, but wish the Kaiel neutralized, out of fear that the Kaiel will sterilize Soebo and its populace by fire once they learn the contagious nature of the diseases perfected by the Mnankrei.*

As Comfort, Humility aids Joesai and follows him back to his camp where she infects all of his "judges." Joesai anguishes as he lies dying, knowing that he has failed Hoemei by falling into the trap Aesoe has set for him—to be a foil to uncover attack strategy of the Mnankrei so that Bendaien will be prepared for the real battle. Joesai's most horrible final thought is that he is dying unclean, not fit for Funeral Feast.

* * *

When masters play, treachery is their least valued tactic, not because the ways of deceit are ineffective but because of long-term consequences. Is not the treacherous player isolated by mistrust during the end game?

Tae ran-Kaiel at the
Funeral Feast for Seir on-Biel

Her killing mood as invisible as her secret name, the Queen of Life-before-Death stalked slowly through the Swift Wind's victory party, hidden behind the persona called Sugarpie whose distracted smile was quick to say hello and nervous eyes quick to wander in search of people more worthy of a smile, the perfect mask for an executioner in waiting. Humility listened and gossiped.

There were no Mnankrei wives present. This was Nie t'Fosal's triumph, a celebration of male prowess.

Everywhere the talk gave the Winterstorm Master of the Mnankrei credit for destroying the Advance Court of the Gathering of Outrage as easily as the Red Death tree poisons the swarming gei. Would not the rest of the Gathering die in the same fevered agonies? No enemy stood against t'Fosal! no friend dared betray him! no woman dominated him!

To a scornful Humility he was a coward.

It was Humility, behind the fawning persona of Radiance, who had been asked by t'Fosal to do his violence for him. It was Humility, behind the cunning persona of Comfort, who had carried out his orders to lay waste the Advance Court of the Gathering before

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it had had time to judge Mnankrei crimes. For these services t'Fosal had not intended to be grateful, treacherously instructing Radiance how to take an antidote after she had infected the food of the Kaiel, knowing that what he gave her was no antidote but a poison violent enough to rip the muscle from her bones. Dead agents needed no reward.

As she drifted through the party, Humility wondered at this madman's perception of people. He despised women and so he perceived the Liethe as incompetent to perform a simple chemical analysis. Humility herself had done the preliminary toxicity study of his "antidote," a normal Liethe precaution, and had been appalled by the crudity of his chemicals as well as his tactics. Moments after learning t'Fosal would spend the night alone in his eyrie, Humility departed the celebration and dropped into the cabin of a small canal boat manned by an adolescent se-Tufi. The guise of Sugarpie was exchanged for the black robes of the night assassin.

They poled the boat to the buildings where Radiance had been but once. Humility, kissing her young sister, disappeared into the shadows and, from the cover of a silent alley, climbed the walls until she gained one of the slate rooftops that led to the tower lair of her prey. A rope trick and a swift flying fall took her to a parapet of the tower. Another climb found the hexagonal window. Nie had never noticed how Radiance had spent a pensive interlude beside that window. Now the lock broke easily and she entered this place where the leader of the Swift Wind did most of his lonely thinking and some of his chemical trickery. Once inside she reclosed the hexagon.

The joy of killing was on her.

Carefully she folded away the black robe and its contents, keeping only the ring that t'Fosal had given to Radiance, which she wore on her index finger, and a perfumed garter for her right leg where she could reach it with one touch of her fingers. She rememorized the room, checking over possible emergencies, and then crawled into bed and went to sleep. . . .

Alertness! He was here! From the sheets she watched t'Fosal lock his massive door behind him. He was already halfway to the bed before the shock of her appearance registered. She chose exactly that moment to emerge from her coverings.

"My lover." The toes of her gartered leg reached over the pillows and a happy breath moved her body as she held her ring hand toward him, telling him with her smile that no other man on Geta was as powerful as her master. She watched Nie struggle with this vibrant image of a woman he knew to be dead.

"I didn't invite you here!" he said coldly.

She bowed her head contritely. "I had *such* a headache after that antidote. What was in it? I hope it worked. Liethe bodies are immune to just about everything." She watched his amazement as he calculated the number of grains of poison she must have survived. Was she killable? She let him think about that, then apologized with a voice that evoked forgiveness. "I'm sorry I missed your party. It was all I could do to drag myself up here. But you're pleased that I destroyed your enemies?"

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"How did you get in?"

She smiled coyly. "I don't remember. I had a headache. Liethe can walk through walls when they really want to be with their lovers. We're a magical clan."

"It's my private place!"

The better for killing you, thought the Queen. "Oh," Radiance cried pitiably. "I've angered you and all I wanted to do was please you. Punish me! I don't mind when you punish me because you are so just. There's a cane over there," she said, pointing with her ring finger to a rod heavy enough to kill her, tempting him. She crawled from the bed and began to grovel toward him on her hands and knees. "Punish me. Beat me till you feel better!"

At the moment he reached for the rod, she was close enough to spring with her dancer's legs. She was already disconnecting the motor nerves between his brain and body with a tiny syringe she had pulled from her garter as he tried to roll away from her. A heartbeat later her thin knife cut vocal cords to stifle his scream. She disconnected his tongue, and with other quick probes eliminated all sensation from his body. Yet he was alive.

"Look at me and see my hate!" she sneered as she slipped a tool behind his eyeball and destroyed the vision in one eye. She turned his good eye toward her. "I am the face of hatred! I am the Vengeance of Geta come for you. I am the sibyl of the Silent God!" It astonished her to be talking to a man while she was killing him, to want him to see her hatred.

Trembling, she disconnected his other eye, continuing to rave in a whisper to functioning ears. "When the clans of Soebo desert your Swift Wind, your priests will become a mind severed from its body. I've seen one of the women in whose body you grew your disease. Does that make me, a woman, loyal to you? You have stupidly thought to poison a Liethe who knows poisons, and the whole clan rises against you. Are we the only clan so offended?"

An old discipline watched her lack of control with dismay. What was served by striking at a victim's ego? Would he then jump away from his crimes? Was this need to hurt a defiance of someone seen to be stronger? *Boasting gives an opponent time to react,* echoed the voices of her teachers. *Boasting tells your opponent that you fear him.*

Humility breathed. The White Mind took over. Then, silently, she destroyed his hearing. Whoever might come now would be unable to communicate with Nie to discover what had happened and who to blame. She rose from the once most powerful man of Soebo to redress in her black robe. She coiled the rope about her waist while she checked escape routes.

The se-Tufi Who Finds Pebbles, her crone mother in Kaiel-hontokae, had said that the Liethe ruled Geta. Perhaps it was true. She looked down at the priest she had forcibly imprisoned in his own skull, her killer instincts still at full alert, for he was not the only danger. How alone it was to have power. She could never share this triumph even with Hoemei, who understood power.

Quietly she set up an apparatus to drip poison into t'Fosal through a tube connected to the blood vessels of his wrist.

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She had given much thought to the choice of the poison. It was temperature resistant and not affected by roasting. It was slow-acting even in huge doses, but still lethal in minute quantity. And it was known only to the Liethe.

Afterwards, she lifted Nie, laying him out in a pillowed comfort he could not feel. All day he marinated in the poison, but before it killed him she slashed his wrists and let him bleed to death. She left a knife in his hand in the normal position for Ritual Suicide. An autopsy would discover that he had been murdered but not that he was poisoned bait.

The long shadows across the room faded into the dimness of twilight while Humility cleaned out every clue of her presence. When the nocturnal stars opened their eyes she left by the window whose lock had been repaired. It clicked shut and she became a rooftop shadow again.

48

My dreams were the color of my family quilt washed in the mountain stream until it was as faded as the dawn of the late morning, smelling of rock and tree spore, moist as the hand of fear. Yet children's eyes remember the colors my grandmother wove like laughter stained by slippery grass. Today I finger that quilt, imagining the sudden reds of the mountain's ember flower, and the boiled blue dye of pfeina bark in the buckets. So are dreams remended into the worn fabric that once warmed my sisters from the snowing flakes.

The hermit Ki from
"Notes In A Bottle"

It is said that the hermits arose before God stopped speaking. Geta is a vast land and there are valleys and corners and mountaintops and whole deserts where men never go. Along the borders of these lands a wayward traveler might find the ruins of a hermit's stone hut, his altar to God, and perhaps even a stairway.

A conical stairway is the sure signature that a hermit once lived among the surrounding barrens. Sometimes a later hermit will repair the work of a long-dead hermit's hand and begin to add to the spiral hill, built cone by layered cone, stone on stone for a purpose without reason.

How did the stairway tradition continue? Perhaps it was the wonder these bizarre objects caused, the whispers of puzzlement which, reaching mad ears, inspired the next generation of hermits who went forth. They were all mad.

Was that not Joesai among the shadows?

Oelita's father had shown her this ravine when she was adult enough to follow him into the desert. He noted such places carefully because they always meant water—never easy water, but maybe a cup or two at the bottom of a sand-clogged well.

Her boy from Sorrow, whom she brought with her from Kaiel-hontokae, helped her at first. They cleaned out the pulpy stalks of the man-high Godstorch and fitted them together, thin top into thick base, to make pipe that led dripping water from the fault-cave to the hermit's hut. Once the water was in and

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the roof rebuilt, she drove the boy away. He did not want to leave her alone but she raved and beat at him with a broken stalk, forcing his retreat to a ridge. From there he watched her until the second setting of the sun's red arch beyond the badlands—reluctantly fading into the west as the sun faded, vowing he would be back someday with supplies and messages from those who loved her.

She rationed her motions on a pattern of cyclic flow that was unconscious of weeks or time, content to mark the passage of sun, then stars. Food and water had priority. She always spent some effort ranging over the desert wilderness, gathering. Few knew that job as well as she did—what part of the seeds to cast aside, how to boil and then sundry the pith of the running cactus, how to eat the tiny orange and magenta-striped fruits of the low beiera tree.

It was clever how she moved so Joesai would never see her.

Profane food would not be enough, or even satisfying to the secret hungers. Every day she worked a little on her sacred garden. She knew where the wheat would grow and how to set the squash and how to keep the beans alive. She often spent the night in the well cleaning it out, cutting it down another layer.

Other nights were set aside to prepare cloth or to hammer fiber for mats. While she broke soft stems into pieces for soaking so that the fiber might be pounded free, images of God came to her, thrust up from her childhood where they had been left in dungeon by her righteous atheism. A suddenly emergent girl rose from her place, superstitious, to set a glowing coal on the stone altar lest when God passed overhead, looking down, watching His people, He might miss her for the lack of a red glow upon her face.

She settled back on her haunches and began to chat to Hoemei about their twins. She knew he was behind her, motionless in one of his silent moods. In the old days when man was new to Geta's refuge, and the planet had been killing them all so ruthlessly, she explained, twin-bearing had been a premium survival trait looked upon favorably by God.

"They'll be all right," he said clearly in a voice that resonated in her mind, and she felt comfortable with his concern.

Her memories of Kaiel-hontokae still frightened her. It was a city of ten thousand Joesais, immense beyond anything she had imagined a city could be in all her dreaming—streets, buildings, richly gardened temple after temple fed by ethereal aqueducts that passed over the city like multiple Streaks of God, bare-breasted women, fine cloth, shops where you could haggle over the price of the flesh of a child who had failed some creche trial. And machines whose overpowering presence whispered of the distant strength of God.

Here in the desert the red and orange and ochre plateaus rolled away, eroded where sparse vegetation could not hold back the rare flash rains. Here God was almost invisible unless one looked for His passage at night, believing. He was quiet like the stars, but in more of a hurry. There, in the city, God was no Invisible Abstraction. God stood in front of you sternly with the face of Joesai, holding your wrist in iron shack-

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les, arguing, and all your return arguments were met with bulbous glass insects, glowing from an internal red hue, who molested your crystal-from-the-sea and laughed out the resonant words of God telling of the Terror He has saved you from, saved us all from, until there was nowhere to turn but to believe. God had made her ashamed through Joesai. God had appeared to her through Joesai in all the personality of that man's violence let loose with sun-fire devouring great Hiroshima in a moment which charred her own beliefs like a bug zapped in a temple's night row of torches.

Only Teenae understood her.

Could God, who came from a world of Terror, ever love a gentle woman? She hid from Him in the desert, yet left coals on the hermit-carved altar so that He might find her in His passage. Was this Saviour God also the God of the temples who took the weaker children so that His mankind might become strong enough to face the horrors of the Sky? How could He do that and be a Saviour, too?

Oelita's pregnancy dominated her. Nothing had been more unshakable than her refusal to bear children after her genetically crippled twins had been condemned to death for lack of kalothi. But when a woman loses her purpose, does she not hark back to an older purpose? The pregnancy had been premeditated. The city of Kaiel-hontokae was within her womb now, growing with arrogant power, its men the fathers of her second brood. The maran-Kaiel were formidable in her memory.

Gaet still warmed her dreams. She had to be half asleep, in a pleasant mood, perhaps leaning against the wall, before he would come and joke with her and play his noble charm. Hoemei was more reliable. He came to her while she was awake. Gaet had an emotional gentleness that attracted her, stirred her very genes; Hoemei was of the mind's gentleness—once he had shown her how to clarify a thought of hers with which she knew he strongly disagreed. How easy he was to reach.

"Hoemei? Are you there?"

"I'm reading," he said from the shadows at her back.

"You don't remember the pillow play when you gave me child," she laughed. Her one clear memory of tender infatuation for Hoemei came from that afternoon. She was using his chest as pillow and he had an arm on her far shoulder and the other hand in her forest while she stared somewhat obliviously at his chin knowing that she had made him a father. Why should she remember that moment so clearly? She had intended, then, to wash away the pregnancy with her blood.

Sleepily she put away her work, gestured a final benediction before the altar, and crawled to her mat. She put her hand out for Hoemei. "Hoemei!" He was gone. *He works too hard,* she thought sadly.

Joesai was with her always. He was the dream man behind the bush or door who would appear in costume and shatter any plot. Awake, she often startled to see him as a speck on a distant ridge or he would be the shadow that had sneaked into her hut at twilight. In dreams he never ran after her when she fled but he always caught her and she would wake up gasping at the memory

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of his strength as he tied her into yet another death puzzle.

He tracked her in her dreams. He waited. If her leg was sore, he attacked her physically. If she grieved, he smiled and attacked her emotionally. She would turn a corner and find him reading from some prized handwritten manuscript with a sarcastic sneer on his face. She would brace herself and then he would look up—and deliver a one-sentence riposte that would undercut the very substance of her words. Sometimes Oelita would waken in her hut sure that a faint outside noise was the prowling of Joesai.

Once she had a dream about Noe buying lifeless twins at a temple butchery.

Days passed. Oelita made an uneasy peace with God, praying ever more frequently on her knees at the altar. While she worked, while she rested, she had been scanning every Chant she knew for hidden wisdom. It was like her that she discovered a God of the Sky who differed from the God of the temples. The orange sun rose and fell. Her belly was filled with kickings. She began to spend whole days inside the hut preparing profane foods to rid them of the poisons.

It rained. The shower lasted only during the twilight but days later a glory of flowers had popped up all over the barren hills, seducing the insects into mad excess. She could not resist a long waddle down the ravine, picking blue desert-lips for her hair. The restless wandering did not tire her. There were rocks she had removed from her garden and she began to carry them over to the stairway, a few at a time, placing them in the stairway so that they were solidly secured against weather, against age, against the force of roots. The previous hermit, dead before her father was born, had placed his rocks with exquisite care. She honored him with as much care.

Nightfall caught her at the apex of her stairway to the stars. Flowers had folded while insects began a nocturnal chatter, seeking mates. It was a clear desert solitude for star-watching. The Mist River flowed above the horizon bringing with it the constellations of the Moth and the Knave.

I am alone with beauty.

Darkness and distance hid whatever treachery might roil beyond that domed excellence. *In a way, we are all hermits,* she thought. *God is a recluse like me.* What gods had driven Him to this secluded edge of space to meditate while others destroyed? She felt a sudden kinship with Him, and, as if in sympathetic response, He began His rise above the ragged black horizon to steer across the starfield.

Is it true that kindness is only the first symptom of a weak will? Did gentle people have to retreat into total isolation to survive? Perhaps God was no fierce protector; perhaps He was only a kind soul who had run from stellar warriors as Oelita had run from Joesai. Such ideas stimulated anger. She would not believe such heresy! Gentleness was the noblest of virtues! Kindness would make the world whole! Caring for the weak took a deeper strength!

Vicious images out of *The Forge of War* flooded her vision from every blazing star. Atop her stairway she began to curse this collage of armies with all the might of her raging lungs. Her acrimony shattered the darkened desert, reflecting from every arroyo, amplify-

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ing up the cliffs to throw its wrath at the sky of twinkling hiroshimas and baghdad massacres and subtle tortures and avenging hordes of red armor that tracked over the stars, explosively punishing peasants and old women, selecting the occasional child for target practice.

"STOP!" she screamed at the avalanche of image.

A nefarious universe turned evil eyes her way—curiously. The combined assault of that attention hit like a clap of silence. Insects chirped to their mates in tiny voices. Oelita stood frozen on her cairn, searching, ears alert, aware that she was bathed in starlight. Had Joesai heard? She shrank down out of sight, listening for breathing, the crack of a twig. She dared not go back to the hut. She spent the night alone, trembling, hidden in the brush on the ledge above her wheat.

49

. . . you must mobilize all forces, establish a troika of dictators, introduce immediate mass terror, shoot and deport hundreds of prostitutes who ply soldiers and officers with vodka. Do not hesitate for a moment. . . .

Lenin in The Forge of War

When Teenae took upon herself the duties of working in the forward organization, duties requiring her to slip in and out of Sorrow in her mediations with the people of the Gentle Heresy, she used the already-translated portions of *The Forge of War* as her primary textbook. She became fascinated by a fanatic she found in that vile history who was plagued by the Riethe madness.

Teenae judged Lenin lacking in kalothi. It was a Kaiel teaching that terrible consequences inevitably arise when a priest brings simple solutions to complex problems of government. When Lenin's solutions did not work he was content to let terror impose his visions upon reality, having neither the courage nor the intelligence to rethink his position. He destroyed all men who opposed him, all thought and emotion which contradicted him. In the end, Lenin had nothing to offer but Restoration. He destroyed the Tsar by becoming Tsar. His nation was left so bereft of conscience that for five generations it puzzled over the simplest of ethical questions without finding answers, stubbornly seeking to dominate Riethe with no more than Lenin's unimproved vision.

God's History made it easier for her to understand the Mnankrei. Gaet was not yet ready to understand. He had never met the Mnankrei, never faced death in combat with their ambition, never hung in terror from a yardarm of one of their ships. For a moment Teenae worshipped her contact with Joesai. His strength had become her strength. The plague of Lenin's life gave her a resolve that frightened her.

She would see that Sorrow was ready to resist the Mnankrei, when they sailed into the harbor in alliance with the Stgal. Gaet could not help her. The Stgal would not. She shrugged. A priest clan like the Stgal, foolish enough to try surviving by playing one great clan off against another, was dreaming its way to an ugly fate.

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In her fragments of *The Forge of War* Teenae found descriptions of naval conflict. She played with the ideas like the kolgame master that she was. All warfare, she had discovered, was based on deception. A military commander had to have a bag of surprises and the ability to use them quickly. Every army had to have a disciplined set of rules—and know how to break one every time it wanted a victory.

By rayvoice she got a call telling her that three ships had left Soebo for Sorrow under the command of Storm Master Tonpa. Being of a mathematical nature, she understood that there are many points where force can be applied to achieve victory, but only one point where a *minimum* of force works to the same end. Being Kaiel-trained, she knew that minimum force assured the longest victory. For weeks she pored through *The Forge of War* and built her plans.

A stormy gale lashed in from the sea, driving the spume off the wavetops. Teenae's spies ducked into the hut and told her that the Mnankrei vessels had arrived. There hadn't been enough warning because of the fog. Cursing, she scampered to the observation station just in time to see the three ships breaking into the relative quiet of the bay. She shouted orders in her first moment of confusion and then relaxed knowing that Tonpa would have to delay unloading until the storm had subsided.

A full day it took the smaller double-masted ships to dock and begin disgorging their wheat and casks of famous Mnankrei whisky. A small barge shuttled loads of grain from the bigger three-masted vessel, Tonpa's command. Curious boats surrounded the flagship. One of them was Teenae's. Through a lens she watched the Stgal greet their saviors who would have the Stgal for snacks once their usefulness was done.

She gave orders for her rifles to take up position. Each of Tonpa's men was assigned a double tail—an inconspicuous heretic and a Kaiel rifleman. Poor Gaet was probably hiding somewhere. He would not touch a rifle and he was not fond of violence. She had three portable rayvoices in operation and a whole system of rooftop flag stations, except she was using people and coded costumes instead of flags.

The first important message she received was that her bomb had been attached to the bottom of the flagship. It had two fuses, one a clock, already set and ticking, the other a sonically activated switch. The Mnankrei knew nothing of war.

The second important message she received was that the fire bombs for the smaller docked ships were in place. The Mnankrei knew nothing about the fate of the Spanish Armada.

The third important message she received, from a horrified runner, was that Gaet had taken it upon himself to negotiate with the Mnankrei and had been forcibly removed to the Temple and was now a prisoner of the sea priests and the Stgal.

She left her command post in a towering rage with four Kaiel riflemen who had to listen to the brunt of her cursing. "That husband of mine! A smile! A caress! A little flattery! A little haggling! He thinks himself able to trade with any man! What did I do to deserve

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a husband like that! I'll have his hide for a duffle bag! God! God above!''

Her rifle was swinging in the fierce grip of her hand, her black hair flowing and flapping about the bald streak down the center of her head that needed a shave, her breasts bobbing inside her light blouse with every angry pace that took her closer to the Temple.

She met the slyly smiling Stgal who presented her with their demands that the Kaiel return from whence they had come. Her mind was a storm. She had to be quick or Gaet would die. She wasn't ready yet. They had captured Gaet too soon. The ships weren't fully unloaded and the people of Sorrow needed that wheat. She pretended to pace, to consider the Stgal demand. Instead she passed to high ground and gave the signal.

A ripple of colored gowns paraded upon the rooftops of Sorrow.

Distant *whoomps* broke the silence. There was a pause while the expression on the face of the Stgal changed. Then two great shafts of fire rose to the sky. ''I shall write you a reply,'' she said, turning to the Stgal. She could hear rifle cracks. There would be feasting tonight but her mind could only think of her beloved Gaet who had bought her in the child market. She fought back the tears. Somehow the words that came to the paper she was preparing were Leninesque in their heartlessness.

''Your message received. It is necessary that Gaet maran-Kaiel be released *immediately*.'' Immediately was Lenin's favorite word. ''All Stgal who do not comply will be pebbled without mercy by sunfall. The Mnankrei fleet no longer exists. The sea priests occupying the town have been eliminated. Conduct yourselves accordingly.''

She triggered her rifle to fire into the air under the nose of the young priest, shattering his nerves, and sent him to deliver her demand.

Stgal lookouts in the Temple tower saw the destruction of the Mnankrei fleet before their sea-priest guests were aware of the disaster. There was whispering. Then Teenae's message arrived, stated in a language so blunt, and promising consequences so bizarre, that they immediately switched sides without telling the Mnankrei until they were tied up and Gaet freed.

''You are emotional and not logical,'' she raged when she was escorted into Gaet's presence. The sight of him whole, with his skin still on, quieted her trembling. ''Oh Gaet!''

''I've been signing up my captors for my constituency,'' said Gaet, smiling.

''You machine! I don't think you were a bit worried while I was out there scared to death for your life!''

''You've created problems for us.''

''I captured the whole town!''

''I was in the middle of negotiating with the Storm Master for a pair of boots when we were so rudely interrupted.''

''You have him?'' Teenae questioned, a glint of hatred in her eyes.

''He's in the tower.''

''I get him! Tonpa is mine! I want to conduct the Last Rites! I'm a priest. You made me a Kaiel when you married me!''

''There is no pleasure in revenge,'' said Gaet sadly.

''There is! I want my boots! Nobody else has boots with the storm wave design!''

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50

If a man has been tamed,
The woman is never blamed.
From the Liethe's
"Veil of Chants"

When the orange furnace of Getasun became a distorted red oval at sunset, the great gongs began to sound over Soebo in a dirge for Winterstorm Master t'Fosal.

On the banks of the Blue Canal Humility listened quietly. The rollings of the bass vibrations were the echoes of her swift deed reflected off the mountainous grief of hundreds of the Mnankrei who had allied themselves with his vision. She waited in foreboding during these city-wide preparations for his Awful Funeral Feast. Who would declare against the policies of the Swift Wind and refuse to attend?

Flesh told her that even High Wave Ogar tu'Ama was wondering one moment if he should partake of Fosal's flesh as a gesture of reconciliation and then, the next moment, glooming that the murder meant nothing, that the young ones of the Swift Wind would simply take over and run a more ruthless ship.

Ogar was an old man but his vacillations carried with them the energy of the sea, sometimes calm, sometimes cresting and troughing with sickening speed. This was the man the crones would place as the Master of the Mnankrei! He could make fiery speeches and pinpoint moral issues but he could not delegate authority and somehow in his long life, with only one wife and no husbands to help him, he had never been able to block the Swift Wind. She ordered Flesh to keep him away from the Funeral.

Days later it was as Sugarpie that Humility first heard the rumors telling of the sickness and death of the powerful men of Soebo who had attended the somber Funeral Feast. A relieved and then gleeful Queen of Life-before-Death skipped over a puddle and began to play Miss-the-Crack on the cobblestones and managed twenty-seven hops before she slipped. Sugarpie wandered from bakery to n'Orap skin shop to stall to bazaar to park, her curiosity aflame, listening and provoking response and adding her own black comment now and then to the wild rumors.

Her wagging tongue was of the opinion that the virulent disease the Mnankrei priests had launched against the Gathering had got loose and been caught by the men who created it and it served them right for mixing the sacred and profane in ways God had never intended and God only knew but that this horrible disease which made your eyes bulge and your head wobble might break out all over the city soon enough.

Soebo was uneasy by nightfall.

By morning the rumors had become terrifying. Over a hundred Mnankrei had died in the night and they were being *cremated* in secret! They had become unclean! The best of the Swift Wind were unfit to eat! And the Kaiel! The *ghosts* of the defeated Kaiel were advancing on the city and they were coming with the vengeful fury of the sinister winterstorm, piling the waves before them like a wall moved by the wind.

Humility had spent the night as Com-

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fort describing to Ogar in rich detail the dying agonies of those who had been foolish enough to pay homage to the great t'Fosal at his Final Feast. A long night it had been, and the rumors were well into their late-morning form before she heard them. Unbelievable! The Judges were coming! She rushed from tu'Ama's residence to the hive, striding, sometimes running.

"Is it Bendaein or Joesai?" she asked, breathless.

"It is Joesai the Scythe," said the crone.

Humility turned her face because tears had burst upon her cheeks. Without dressing for the journey, she hired an Ivieth palanquin to carry her toward the Gathering as far as those giants would take her and then continued impatiently on foot, still wearing Comfort's flighty morning dress which had been chosen to please the High Wave to make up for her teasing.

She saw them before they saw her. They were hardly the storm wave that the morning gossip described. She recognized them because each of the distant figures carried a rifle. They moved with no great speed. A small group would take some high point, whether it be hill or roof, from which to cover the flow of their fellow judges. Behind that point she assumed was the main body of Kaiel youth. She pressed on, cursing herself for not bringing walking shoes. She was captured by one of the girls she had taught to dance.

The three female riflemen handled her more roughly than any men would have. They tied her hands behind her back so tightly her fingers went numb and they dragged her along the road through the Gathering on a long leash about her neck that nearly choked the breath from her. Those they met gave her a wide detour. Even Joesai, walking with the two-wheeled supply wagons, would not come closer to her than several man-lengths.

She bowed to him, kneeling and touching her head to the ground, graceful even though her hands were tied.

"Just the woman I want to skin alive." He was scowling.

"Why? Have I committed some crime?"

"To some, I won't say who, the murder of a Kaiel is no crime."

"You are a ghost then, as the rumors in Soebo say?"

"Ho! You tease me. But three of my judges died."

She bowed her head. "For that I am sorry. Eight Liethe also died, and more horribly."

"The Liethe die, too? For that I am sorry," he mocked.

"I have come for my reward," she said brazenly.

He grunted. "Your reward shall be a knife for your wrists."

"I would prefer that you transfer to the Liethe the deeds of the Palace of Morning. That was to have been my present from t'Fosal and I want it! You, too, promised that if I helped you, the Palace of the Morning would be my gift!"

Joesai laughed a genuine laugh of amazement. "Is it usual in Soebo to reward treachery so lavishly?"

"Are you not alive? Most of you? You may kiss my feet." Her voice trembled. "I was afraid that I had miscalculated and you were dead. But you are

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more than alive! You have become invulnerable! Liethe gifts are not given freely. I have earned my reward!''

He went to his haunches so that their conversation might be less awkward. ''You speak like a madwoman.'' He loosened her collar. ''I am to reward you for bringing t'Fosal's sacred disease to my camp?''

Humility smiled insolently. ''I did not bring the disease. I brought the antidote developed at great expense in life by the Liethe of Soebo. If I had brought you the disease you would all be mindless. The Liethe antidote mocks the disease and grants immunity but the microlife carrier does not contain the genes that cripple.''

''What?''

''You have been immunized. You received a tocaein.''

''The honored tocaeins of our temples are the teachers of games—not the givers of pain.''

She mocked Joesai's seriousness. ''The tocaein is indeed a teacher of games. But does he play to win? Does not the tocaein deliberately handicap his moves so that the novice grows strong by winning? So it is with our potion. It attacks you only to challenge your body to great efforts so that when the real attack comes, you are ready. Your body has matched wits with a tocaein who has taught you how to resist the deadliest of Mnankrei ploys.''

Joesai softened as one of his major worries evaporated. ''You could have told us,'' he said gruffly.

She watched him with a mischievous glint. ''And would you have permitted me to poison your entire camp? You did not even trust me!''

''I *did* trust you because you helped me free my men from the Temple of Raging Seas.''

''You shouldn't have. Besides, I didn't even know if the Liethe antidote would work. It was very hastily concocted.''

Joesai yowled as if stung by an angry bee. ''Women like you make bitter soup.''

''Untie me, please.''

He cut her bonds. ''And what news from the city?''

''The greatest minds of the Swift Wind have been murdered. Mobs are already out, shouting, gaining courage.''

''Murdered? By whom?''

''It is not known.''

''And those I left behind?''

''I know that one of your Kaiel will be leading a mob to the Temple of Raging Seas. They will find the mindless women in whom t'Fosal's disease is grown and that will feed the rage and fear. The city is headless. It is yours.''

''It is not my hope to frighten the city.''

''I will introduce you to the High Wave tu'Ama. He is a just man. If you deal with him and no others, he will become leader of the Mnankrei and salvage what is left of that clan.'' Studying Joesai's mood, she took his arm affectionately as if she were about to ask for another Palace of the Morning. ''Take from them their priesthood, but leave them their ships and the city will be soothed by your mercy.''

''It is a strange scene you paint. I will send men forward to confirm. If true we will move in today.''

''Strike today,'' she said.

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He kicked a stone. "Will the children bring me flowers?"

"Of course. And tu'Ama, the coward, will offer me to you as a present and pay the coin I cost from his vaults."

Joesai stepped aside and gave orders. He walked for a long while beside Humility, absorbing his surprise. He laughed and spoke. "My brother Hoemei has vision. I would not have believed it. He told me that if I waited patiently enough, I would walk into the city unopposed."

"A man only has a clear vision if he has friends who care enough to share his vision and make it real for him." *Hoemei taught me that,* she thought, wishing she could say it. "May I ride on your shoulders?" she cajoled.

He laughed and three riflemen who had been keeping their ears cocked also laughed. "*I'm* the tired one," complained Joesai. He lifted his leg and climbed onto *her* shoulders so that she buckled and he had to walk along on tip toes with her head between his legs.

"You're mean!" She was outraged.

"All right, little undecorated child." He picked her up and threw her legs around his neck. She grabbed his hair and stooped to whisper in his ear. "When do I get my Palace?"

51

It is recorded that Bendaein hosa-Kaiel took the Gathering of Outrage to the island of Mnank on an awesome strategy of evasion, moving to those places where he was least expected. Only when Soebo had been completely demoralized by his unpredictability did he send his Second Judge in a lightning thrust at the heart of the city to restore order.

Coieda mahos-Kaiel
first son of Bendaein in
"Honor for the Outraged"

The annexation of Mnank by the Kaiel had fascinated the whole Race. Bendaein hosa-Kaiel claimed all the glory while Joesai came to live out his exile in obscure residence near Sorrow, forbidden by Aesoe ever to return to Kaiel-hontokae. But Time sweeps away all things. The de-priesting of the Mnankrei slipped into the realm of past events. Now the clans of Geta were concerned with more important matters such as the rayvoice, the revelations from *The Forge of War,* steam engines, rockets, kalothi among the stars. Debate raged: How was minuscule Geta to meet the Unknown Danger that had been slowly filling the Night Sky all during the Millennium of God's Silence? Was it not awesome to be born into the new Millennium of the Saviour Who Speaks to God?

In exile, with time on his hands, Joesai sometimes wondered what had become of Comfort. Rumor said she had been given to Bendaein. The last he had seen of her was a surprise visit on the docks before he and Noe boarded ship. Joesai often recalled that immortal day long gone when he had entered Soebo with his Advance Court. He would smile at the ridiculous image of himself staggering into the city at the height of the insurrection like a common Ivieth with a Liethe whore riding his shoulders, having just bought Soebo with a palace he did not own.

Those had been turbulent days com-

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pared with exile. He had been in control, not because he could have done anything with the mobs, but because the mobs did not want the power they had usurped—they were traditional folk, shocked by their own rage and fear. It had been a time of rushed juggling, marathon talks with every clan leader he could find, speeches at the flaming cremation for the diseased women taken from the Temple of Raging Seas, and the consecration of countless Ritual Suicides. The city returned almost to normal after six sunsets. Two weeks later Bendaein arrived in glorious procession.

A little girl of Sorrow had once asked him how he came to be in exile. "I fell in love with a woman who was also loved by a very powerful man. She had my child, and he does not want me around so he never forgives me, finding crimes to blacken my name."

"That's sad. A man who keeps a woman for himself is not polite. Do you miss her?"

Kathein still came into his life, meeting him infrequently at the sky-eye in the mountains to share their son. He had brought a fine lens grinder with him from Soebo and studied the sky when the petty administrative tasks of Sorrow bored him. He could talk to Kathein about stars.

Joesai carried the title of Coastal Predictor. The de-priested Stgal had built his residence overlooking a curving beach that pointed out toward three rocks rising from the Njarae which, since olden times, had been called the Old Man, the Mother, and the Child of Death. Joesai loved his family's new mansion and, though it was far from finished, it had the beauty of Life Incomplete.

He toured the rooms, seeing that all was ready for Teenae. The cactus flower was blooming and he moved it to a prominent position in the light from the tall leaded window. The luster of the wooden table disappointed him and he found oil for a rubdown. The fruits and breads that Teenae liked were in stock. He poured his best whisky into a better bottle and washed the shot glasses a second time until they sparkled, remembering how Teenae hated to drink from spotted glass. He bathed and perfumed his underarms and put on his cleanest undergarments.

The wirevoice chimed. When he answered, disembodied male words from Sorrow's switchery told him Teenae was on the way. From a balcony in the sloping roof he watched her arrive by skrei-wheel powered by a male and female Ivieth couple. He let them unload her iron-reed basket, then set off two rifle-powder bangers whose "crack! crack!" made the three of them look up in time to see his rocket rise on sparkling tail to explode in a blue flash that spread across the sky while it burned to a dazzling white.

"Joesai!" Teenae screamed up at him, "you'll scare the neighbors out of their skins!"

"This lonely exile welcomes you home, beloved!"

He rushed downstairs to meet her. Teenae was directing the placement of her basket and flashed him the open smile that had addicted him to her. She waited until the basket was safe before she hugged him. "Your bathwater is hot," he said.

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"Don't you ever think of anything besides giving me a bath! The world is falling apart and all you can think of is having a wife on your pillows who doesn't smell! Oh Joesai, I'm too exhausted for even a bath! To think I once *walked* over the mountains!"

"With a little help from our tall friends."

"I'm heading for the whisky and I know where you hide it!"

He followed her to his room, where she poured herself an amber gulp, downed it, undressed, and began to sponge her body with cold water. He tried to help. She pushed him away. "Keep your hands off me," she said almost angrily. "You know how I am when I haven't been with you for a long time. I have to get used to you again. You're so big!" Her pregnancy was showing, her belly just beginning to swell with child. Hoemei's this time.

"Where's Gatee?" Gatee was her baby daughter by Gaet.

"I left her in the mountains with relatives. Noe or Gaet will pick her up when they come out. I thought I'd have you all to myself for awhile before Noe arrives to distract you. Hoemei is coming, too, I hope. I had to practically put a ring in his dong and haul him here by chain. There's trouble in Kaiel-hontokae and I want him away from it."

"I've heard nothing."

"Because nothing is blabbered over the rayvoice. I'm too tired to talk about it." She sank onto the pillows, her profile outlined like stitching in a quilt, her last bit of energy used up.

He touched Oelita's slim book that he had bought from a man who did not know Joesai as the priest who had cast the Death Rite upon his prophetess. It was a present for Teenae. She had a special place in her heart for Oelita. But he took his hand away from the cloth binding. Tomorrow, when she was rested.

Teenae shifted her legs and looked up at Joesai. "I'm not asleep yet. Hug me a little. Don't be shy. You know I'll be madly in love with you again by about the time Scowlmoon goes into eclipse, which isn't too long to wait. Lover." She smiled and ran her finger along the shaved streak across her skull. "Gatee has teeth and she has decided to bite everything!"

"Did anyone ever restore the masonry on the north face?" Joesai was referring to their mansion in Kaiel-hontokae.

"Long ago."

"I miss the city."

"I, for one, am glad to be away. Hoemei has finally split with the Expansionists and you can't believe the uproar that caused! Aesoe is after his hide and when two-husband goes to the Palace he avoids Aesoe. He's furious at the blindness of the Expansionists. He's pulled in a whole group to support him. Aesoe called their proposals and predictions Stomach Thinking because Hoemei's basic policy is Digest First, Eat Later. The conflict is dangerous because the split is basically along creche and non-creche lines."

"That's been coming for a long time."

"You Who Were Born of the Machines are in the minority."

"That won't last."

Teenae gestured impatiently. "Kathein is seeing Hoemei, more and more

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openly—she moons over him publicly, and makes no secret of her sexual interest in him. That drives Aesoe wild and he is about to exile Hoemei, too, or worse. I sent Gaet to talk to her, and she was her usual sweet self, but distant and uncommunicative. Hoemei thinks he is reaching her and will bring her back to us, but I think she is using him in some way I cannot compute."

"She loves and hates Aesoe," said Joesai. He threw his hands up in despair. "And Aesoe is mad. He is so possessed by her that he strains all projects to please her whims."

"She has placed Hoemei in great danger."

Joesai laughed. "I see that Kaiel-hontokae hasn't changed a bit since I was last there."

"Kathein knows that Hoemei will be the next Prime Predictor and she is damming the mountain waters at both ends."

"You think Hoemei has even a chance at that exalted position? He is creche. The non-creche would never permit it."

Teenae rose to a straight sitting position with a fury that made her breasts point like fists. "The succession is not an issue of votes! It is a matter of an audit of the predictions! Such is in Tae's constitution!"

"And have the Kaiel ever hesitated to break the rules?" He chose that moment to present her with Oelita's bound book, done in the crude print of a secret print shop. "She's alive."

Teenae's eyes widened and he could see her heart begin to pound. "How do you know?"

"They keep knowledge of her from me. This book was kept from me. If she is dead, why would they protect her? But that's not the reason I am confident of her health—in this book she speaks of God. She has worked Him into the weft of her warp. That means she has recovered from the shock of discovering that God exists and so has passed safely through the Sixth Trial."

Teenae burst into tears. "I've hoped so to hear that she was all right. So she believes in God now, does she? Do we?"

"Four weeks ago when I was last at the observatory there was a perturbation in His Orbit that can't be accounted for by gravity. Whoever He is, He is not passive; He stirs in His Sleep."

"We should have married Oelita. Our antagonism was immature."

"I know where she is," he said.

When a startled Teenae looked up at her husband she saw an old glint in his eyes. He was older, more cunning, and no less stubborn than he had ever been. "No!" she said. "I forbid it! Leave her alone. That's over! Six is enough!"

52

I passed an old woman of the clan of oe'San living by the river Toer. Her riches were long eyelashes and golden teeth and a body carved in the most intricate cicatrice forms. She owned one ragged gown held together by heavy thread that passed through pierced coins that weighted her every move and jingled. I showed her one silver coin and she reached for it with a flirting smile, but I held back, asking her for her dreams. "I dream of money," she said, and stitched the coin into her rags.

The Hermit Ki from

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"Notes in a Bottle"

Once Kathein had thought she could subdue Aesoe by draining his wealth to feed each of her vast projects, but he had always found more coin. She discovered to her horror that she could never break Aesoe; she could only bankrupt the Kaiel. In a desperate walk along the Hai aqueduct she was trying to figure out a way to leave him.

She could not deny that he had pleased her. He was good-natured and carried brilliance enough to match her own. She loved his parties. She loved the casual way he wielded power, bending rules, doing whatever had to be done. But she *hated* him.

The happiest time of her life had been that long-ago courtship with the maran family. Sometimes, at the height of her enmity for Aesoe, on those rare nights when she took gentle Hoemei to the pillows out of a nostalgia for lost love, the tenderness she found was almost too much to bear. Gaet still courted her but with the genteel formality of the compulsive flirt. Joesai's love had turned to anger and that puzzled her. She kept track of them all. Noe had been to Soebo, a logistics coordinator for the Gathering. Teenae was still trying to organize the world into logical categories—contracts were to be met, secrets were to be kept, and betrayal was to be answered with a lead pebble between the eyes.

How does one refuse a man of power?

She came back from her walk half a day late. Aesoe was distraught. He was not pleased with her leggings or the dust in her hair or the dirt clogging her toenails. It annoyed him that she had kept important guests waiting so long.

She took more time than was necessary to make herself ready and, even then, lingered at the door. They bowed to her, these two priests of the Itraiel, both formally capped by headdresses of iridescent insect wings and clad in black suits fronted by scarf-like collars of brass mail. Black leggings of iron-cloth hugged the skin, interwoven platinum tracery describing the same lethal flower that scarred their faces.

"Kaesim of the kembri-Itraiel," said one.

"Suesar of the kembri-Itraiel," said the other.

Aesoe offered drink. "Our honored friends traveled with the Gathering to Soebo and served as administrators there and are now returning home. They offer us a proposition we must take seriously. I wish you to discuss with them the weapons of *The Forge of War*."

The weapons of the Riethe madmen were not Kathein's favorite subject. "Why?"

"Kaesim and Suesar have been observing our rule in Soebo and have decided that there are advantages to ceding their land to the Kaiel. That is, of course, a bargain, and our end of the bargain must have substance."

Her reply was sarcastic. "In exchange we give them weapons to fry whole towns, cities even, and machine rifles to murder more women and children than can be eaten before they rot?"

Suesar bowed again. He was not insulted. "You impugn our morality," he said formally.

"No. I was questioning the sanity of my bedmate."

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"Sanity!" Aesoe snorted. "Even Hoemei believes that the Sky is full of enemies and that we survive only because we have not been found. God's Sky is also full of other gods, and where one god has gone, so can another bring himself. And what is our defense? Shall we sit and beat these Sky Demons at kol? Shall we take them through the desert and covertly scratch their legs so that they sicken and pass away? Shall we pompously declare them of low kalothi and offer them the knife and a pretty courtesan in some temple tower? Who is to defend us, Kathein?"

"The fire that burns the son burns the daughter!" She took these desert priests, each by a hand, and led them through the Palace maze toward the aroma of Aesoe's private dining quarters. The feast had been kept warm and waiting past its time.

"Geta needs a 'military' clan." Aesoe used the word from *The Forge of War* for there was no such word in the Getan language. "We must know the game of the enemy so that when we meet him we can define the play. Such a role I propose for the Itraiel. We rule; they defend. It is a role that requires study, foresight, dedication, bravery, great game minds, and great kalothi. I think the Itraiel are worthy of this trust and will be challenged by it."

"Perhaps." She considered.

Hoemei had discussed this very matter often with Kathein. The problem was to create a structure in which the soldier clan could not usurp the function of the priests, as had happened many times in the Riethe history expounded in God's *Forge*.

"We think we are well suited to the role," said Kaesim.

Kathein cut him short. "I know the Itraiel." For one heartbeat she saw an image of Kaesim riding turret on a Second World War tank through the North African night with five Gurkhas hitching a ride behind him. Her soul chilled.

They were fierce desert rovers, rulers of a nomadic domain. They had no knowledge of genetic manipulation and she doubted that they had a single genetics workroom. Their temples were tents. They were known for their strange gentleness. What clan made less fuss over physical handicaps? But who could attack a kembri-Itraiel with a dagger and live? It was said that none played games like the Itraiel. Their kalothi rituals were almost purely game-oriented. At their Ninth Year competitions the big losers were expected to organize the joyful Dispersion Feast and by their Ritual Suicide provide sustenance for the long journey home.

Kathein seated her guests, then carved the tiny carcass and heaped their plates with meat and gravy. The foreign priests made some sign over their food and began to eat heartily while Kathein began to recite stories of war, emphasizing atrocity so that she might make these men so loathe the horror of it that they would reconsider the role of warrior clan.

She told of the total extermination of the Jews in Britain on orders of Pope Thrice Innocent so that the English people never thereafter had a Jewish problem. She told of the massacre of the Persians at Thermopylae. She told of the mountain of skulls in India. She told the story of the Turks forever cursed

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with the blood of the Armenians. She told of the inefficiencies of Belsen and the efficiencies of Hiroshima. She told of the post Great War invasion of Poland by Russia, and the retaliatory invasion of Russia by Poland, and of the final solution to the Polish problem when the Russians, a generation later and allied with the Nazis, overran Poland and executed 15,000 members of the Polish military clan and buried them in a mass grave at Katyn.

Twice the God of the Sky passed overhead and still she told her stories. The priests of Itraiel listened to her as one listens to an Ivieth chew the leg of a traveler with tales of distant places. They began to ask her questions about strategy, purpose, gain. She answered the difficult problems they posed as best she could. They tried to make sense of Hitler at Stalingrad and the perplexities so gripped them that, for a moment, they forgot their manners and ate with their fingers. They came to the tentative conclusion that the Riethe were not mad, just stupid.

"They understood weapons," said Kaesim.

"But they did not understand strategy," said Suesar.

Both began to question Kathein about weapons. She told them of axe and sword and crossbow and rifle and cannon and tank and fighter aircraft and helicopter gungods and long-range bombers and ICBMs and spy satellites.

Kaesim grinned through the fei flower scars upon his face. "Maybe God is a spy satellite for the Riethe." He laughed. They all laughed the great laugh till tears came to their eyes, for that was too terrifying a joke to take seriously.

Kathein finished her analysis with an accusing glance at Aesoe as if to say: you would inflict that on us?

"The Riethe pose no absolute threat," mused Suesar. "They may enjoy killing but they seem to have been incapable of mastering strategy. Still we will need weapons. Even a genius is flattened by the mindless boulder rolling down the mountain."

She was furious at these Itraiel for the casual way they were taking her stories. "You would want the *responsibility* of holding in your hands a machine that could make sunfire to devour a whole city?"

"We would welcome it."

Aesoe called for entertainment. His Liethe women entered. Honey played her instrument while Cairnem and Sieen danced. The dark guests shouted encouragement and pleasure, and clapped their hands for it was that type of fast light dance. Then the priests begged to demonstrate their own skill.

They stripped so that they were only wearing their brass belts and genital protectors. Cries erupted from their lips as they began to circle each other on the dance floor, hissing. Of the three Liethe who watched the combat, only the Queen of Life-before-Death stood in rapt fascination. Suesar snarled and attacked and through the magic of swiftness and leverage was thrown high where it appeared he would crash onto the floor. But he pulled and twisted in midair and landed on his feet. The play of kembri wills continued—where a gesture might rescue one from a smashed skull, or an attack might seem to pass right through an opponent. They bowed

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to Aesoe's foot-stamping. Cairnem grinned.

Before they had finished their bows, she was hissing a challenge. The priests turned in astonishment because she had used the kembri form of insult-major. While they stared, she repeated her insult and stripped to her belt, a tiny belt with wooden buckle that matched her tiny size. Kathein expected the girl to be slaughtered on the spot. A flash of Liethe flesh moved. She was dancing in comic imitation of kembri combat, mocking this attack and that feint. The priests watched, awed. Finally she stopped, exhausted, the sweat rolling off her unscarred body, grinning happily. Both men of Itraiel burst out laughing. Every court enjoys a clever fool.

From the persona of Cairnem, Humility was all Liethe grace now and she had an arm for each of them. "I'm part of the hospitality. You may have me this evening." She turned to Aesoe. "After insulting their genitals it is obligatory that I pleasure their egos. So give me permission." She looked Aesoe straight in the eyes.

"And if they had taken umbrage and attacked you?"

"Why, then I would have defeated them and they would have had to pleasure *me!*"

"I see that I have lost my warriors for the evening. The bargaining will continue tomorrow. To other pursuits, then!" Aesoe's hand was on Kathein's shoulder and she felt the sensual restlessness in his fingers.

I haven't the courage to tell him! She felt panic. She could just leave him, leave for Sorrow while he was asleep. She thanked God that all of the maran were gathered in Sorrow this week and so away from Aesoe's reach. It gave her hope. She would throw herself at their feet, begging them to marry her. Kathein's worst fear was that, once she had done so, a wrathful Aesoe would order the death of the maran, all five of them.

She did not believe in the danger from God's Sky. That was an excuse for his ambition. The armies of the kembri-Itraiel would march over Geta with their weapons, uniting the planet for the Kaiel—and Aesoe would say that it was for the best. She saw Hoemei trying to stop him and Hoemei dissolving in a flash of sunfire.

"My honeycomb," murmured Aesoe.

53

Be wary of the Death Rite for you become bonded forever to the one you challenge—whether death or survival is the outcome.

From "The Kaiel Book of Ritual"

They followed the messenger over land that grew progressively more desolate, the gray and red rock surfaces harsher, bolder. Bushes retreated to shelter, then fought to defend their desperate havens. So much of Geta was like this, so much was far worse, yet who dared the really uninhabitable regions? The messenger was taken prisoner just before he reached Oelita.

Joesai sat rooted behind a boulder, caught between the dried branches of a dead bush, watching the Gentle Heretic through the spy-eye. He had her. The joy welled in him.

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"She seems healthy," he said to Eiemeni and the woman Riea.

"We observed children yesterday before you came up."

"There can't be children here!" Joesai exclaimed.

"Two of them. Very young."

He moved in silently, avoiding the line of sight. He was standing by her well, admiring it, before she noticed him. When he turned to look at her, she was frozen.

"You found me." A stricken anguish filled her voice.

"I persist in my goals," he said.

"*Stay in the hut!*" she shouted at the twins, who were rushing to her for protection.

"The children will not be harmed," he said.

"Are you going to kill me?"

"The Death Rite is a test, not an execution."

"You have two more chances at me. That's an execution," she replied bitterly.

"*One* more chance. Trial Six is over. You believe in God now. You handled the challenge to your mind quite well."

"What will happen to my children?" She was crying.

"Who is the father?"

"Hoemei."

"My brother-husband's children are safe." He said that sharply.

"No they aren't. You'll take them to a butchery after you've killed me. They have Ainokie's Disease."

"As a recessive." He shrugged. "That hardly bothers their kalothi. There's a chance that they don't even carry it. When they are grown and wish children, if they have their children at a creche, that gene can be eliminated." He glanced at the hut. "Go reassure them. They are frightened. They feel your fear."

She went and he wandered through the small garden, marvelling.

When she returned the twins were quiet. Children who are afraid whine, but once they have felt the strength of their mother they can understand the necessity of silence. "Are you going to destroy my garden and see if we can survive that?"

"No," he said.

"Tell me why you are here!"

He ignored her. "I'd forget how to talk if I lived in such a bleached place."

"You learn its beauties. I've seen it when there were flowers."

"Show me the cone. I've never climbed one of those."

"So you can throw me off and see if I bounce?"

"Peace," he said softly. "Peace, for now." He found a stone and carried it with him to the hermit's stairway. She followed him. He fitted the rock tightly into the new layer among the other stones and mounted to the top. She climbed behind him but stayed out of pushing range.

"It's quite a domain you have here." His eyes swept the desolate hills and the distant mountains and the high whiffs of cloud. Scowlmoon was a broken orange rock on the horizon and Getasun blazed harshly. "I wouldn't have lasted out here. I would have jumped into the well head-first to drown myself."

"You'd stick before you reached bottom," she commented acidly. "Your hair wouldn't even get wet."

"If I lived out here, I'd be skinny."

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"My children are good company. I don't mind this desert."

"How long do you plan to stay?"

"How long are *you* going to stay? I want you to leave!"

"I'm leaving when you come with me."

"I'm not crazy!"

He laughed. "Yes, you are."

"Crazy people are sent to the temples for their Contribution."

"We humor them first." Joesai let himself smile.

He offered her his food but she refused, recalling Kaiel wizardry at drugs and potions. Oelita offered him flat cakes but he refused, politely noting the abundance of poisons in the surrounding vegetation. They laughed.

He noticed eyes watching his smile and directed it to the boy who buried his head in Oelita's arms. The girl began to compete with her brother. Her gestures were wild and she set up a chatter which her mother seemed to understand—but when she succeeded in attracting Joesai away from her small rival, she, too, fell silent and held her hands over her eyes.

Later, as Joesai prepared to leave, he turned, attacking for the first time. "Your children are not as healthy as you think they are. One day Geta will kill them quickly. Even if you broke a leg, they would die."

She followed him out of the hut. "It is *you* I must watch."

"I've made my camp at a distance."

"You think I'll sleep with you here?"

He stood silently, bulking against the starry desert sky. God began to pass overhead. God's Streak was always a spectacular sight, a pinsized glow of sun-orange light visibly moving across the void, brighter than any star. Oelita, head lifted back in the traditional gesture of supplication, made one fervent prayer: "Let this man be gone!"

Joesai ambled away across the ravine. She followed. He kept his promise to make camp far from her abode. "You'll need some sleep," he said, watching her hunch down to watch him, something panicky in the glow of her eyes.

"I'm not going to let you sleep," she replied.

He curled up on his mat. She poked a stick at him. He played the game, stoically ignoring her. At intervals she poked him or threw a rock. When he heard the faintest insect signal from Eiemeni, Joesai decided it was time to be annoyed. He sat up and began to curse her the way a man desperate for sleep might curse his torturer. She hurled his invective back at him, and he learned the subtleties of Sorrow's gutter language. He shifted tactics and began to plead for her to be reasonable.

She never heard the cries when her children were being silenced. He gave up the argument. She prodded him with irregular mercilessness. Only when the sudden distant wailing of babies caught her ear, to the west of her hut, did she startle and pass into terror. She began to run. He followed her. She flew into and then out of the hut, wild murder in her eyes. "Have you killed them?"

"They are very safe though probably frightened because you are not with them."

"You machine-made bastard!"

"I will take you to them," he said.

She slumped in anguish. "So you've laid your trap."

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"No. I'm taking you out of this Death's Jaw. The Seventh Trial is over. You've survived."

"This?"

"Yes."

"*You* didn't cause me to come here!" Contempt and wild hope and suspicion were all in her voice.

"Who knows the workings of the Death Rite? It seems to affect the challenger as much as the one on trial. I've changed."

"You haven't changed! You're taking me away from my home to kill me! You deceive me that my little haven here is the Last Trial. It has cherished me, protected me! My spring, the abode of Death? I love this place. You will lead me from here in chains to the Seventh Trial and *that* will kill me."

"The Last Trial, though the most difficult of the trials, cannot be a death but *by law* must be a measure of your kalothi. This ravine could be harsher, yes, but then it would be a simple assassin. What would it tell us of your kalothi? To have settled in *this* place and lived is possible but not probable. You have great kalothi, Oelita, and I am bonded to you by my own foolishness in casting such a Rite of Trial upon you. I owe you a Great Favor."

"Then you must return my children and leave me here in peace," she said bitterly.

"The bond of kalothi does not require me to humor my friend's madness." He loaded her packsack. "Your twins are waiting. They have never before been separated from you. They will be suffering."

She had no choice but to follow him. For the most part she did so silently, but sometimes she would stab insults at his back. "You're the same long-tailed monster I've always known!"

"I'm a mellowed monster."

"To sip you is to quaff the burning taste of raw whisky!"

He led her over a ridge that showed them the whole dome of the stars under the desert night. "Every life is a whisky cask with a man inside," he said, "and the man struggles to break through the burnt barrier of his person but never gets out. He only grows mellower."

"Don't compare my life with that wooden barrel you wear for a head!"

A long pause mediated the altercation as they negotiated a razorback outcropping. On the other side he spoke to the stones in front of his feet. "I remember when I started this thing. I was going to deliver to God an inferior upstart. One of my wives asked me how we might be reconciled if, at the conclusion, you were to prove pleasing to God. I said this was no concern of mine because the only way you could survive was to kill me first—there was room in this world for only one of us. Thus I have created a problem for myself." He chuckled.

"And I remember that you enjoyed it! I remember drowning in the Njarae while you watched as you might have delighted in watching a pinned spider in a carnivorous feiri hive!"

"Ho! You accuse me of enjoying your pain? It is true that every time I set a trap the grins were upon me, but every time you survived I found within myself this cancerous traitor growing in happiness. You ran from me, but in the end I, too, ran from you. I have never felt such joy as when first I saw you in

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my spy-eye tending your hermit's garden."

Oelita cried when her children were brought to her from Joesai's tent. At her reappearance, the twins were too stunned to speak but clung to her. The three slept bundled together in the tent. When Oelita woke, she found Joesai stretched beside her, watching her, one young guard outside, and the noise of an eight-man camp. The sense of danger was gone. "What are you going to do with me?"

"I have carefully considered that. I am bonded to you."

"That could be a nuisance to me!"

"We will be married."

She rose to her elbows, waking sleeping infants. She breathed, "We will not!"

"Don't say I wasn't generous," he said with Noe's straight face. "I gave you seven chances to decline the offer."

She stared at him, amazed. He was teasing her! She groped for words, intrigued by the game. How did one tickle a friendly monster who was known to have a bad temper? "Is *this* your Seventh Trial: marriage? I think I've been very good at avoiding that one." Suddenly she laughed.

54

To ride on a man's back, you must have a tight grip on his ears.

A proverb of the Liethe

The new Liethe hive in the city of Kaiel-hontokae was the old Temple of God's Praises, a mere stroll from the whisky warehouse of the old hive which was kept as a cell block for budding Liethe. In the tower of God's Praises the notorious crone known as the se-Tufi Who Finds Pebbles poured her tea into a pale blue o'ca cup that sat on top of the oiled goldwood box that was her private wirevoice. "You wish my advice," she stated blandly.

A woman stood in front of her with the peculiar poise that comes before the discovery of age and after the loss of innocence. "It is more than I can handle," pleaded Humility.

"It is always more than any of us can handle."

"I need to make a wise decision."

"We will live with whatever decision you make."

"Why are you doing this to me?"

"You have been well trained, and if you fail it is our failure also. Time passes. In the same storm the river that displaces a grain of sand, replaces that grain of sand. The old die and the young grow older. When we were young, the crones did not make for us the critical decision of our lives. Thus we learned to rule before our teachers died. Before I die, I wish to see who you are when you work alone."

"I've always worked alone," said Humility rebelliously.

"You have obeyed our orders," said the crone sternly.

Humility changed tactics. "Aesoe is in violation of Kaiel law. The predictions are to be audited and the man with the best record automatically becomes Prime Predictor regardless of his political beliefs or his alliances."

"It is not so simple. One principle that the Liethe have learned in our parasitic role is that the law is never clear

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no matter how many noses are grafted onto the public face. The o'Tghalie say that the law is a map and, by theorem, that every map fails to locate at least one stone."

Humility insisted. "I have done a major gaming of the audit myself with the help of young girls in my class who I am training in Kaiel politics. Hoemei should have been declared Prime Predictor and the policies of Aesoe should be void."

" 'Should' is a word with volume enough to paint infinity. A point in case: Tae ran-Kaiel wrote the present constitution of the Kaiel. He refined the unwritten traditions of succession that were no longer working. Indeed, he specified that audits of the Archives must take place and that the best predictor must be elevated to Prime Predictor. But no man challenged Tae in his lifetime. Even Aesoe, Tae's best student, never came close. Aesoe was declared Prime Predictor only *after* the audit following the Immortal Funeral Feast. Thus the tradition is not clear in the minds of men, however clear it is upon paper. Does the audit that determines the new Prime Predictor come before or after the death of the old Prime Predictor? May a Prime Predictor be replaced by a rival or must the rival wait on Death?"

"The law is clear," said Humility.

"And you are in love with Hoemei. Others are not. The law is what is read, not what is written."

"I beg you, crone mother, this matter is of some importance. Aesoe's policies have drastic consequences for the Liethe and for all of Geta, and Hoemei's policies a very different consequence."

"Doubtless in a thousand-thousand revolutions of Geta about Getasun it shall seem as the differences between the red and blue flecks of the sandstone of the Dry Bones."

Humility flared. "It is against the Word of God as revealed in *The Forge of War*! Shall we be only another star among all stars? Aesoe has succumbed to wicked temptation! He would follow the policies of the Riethe devils and call it defense! Only a week ago as Cairnem I mussed the pillows of two priests of the kembri-Itraiel who have come here to negotiate with Aesoe's Expansionists, hoping to relinquish their priest status, before they are conquered, in exchange for the role of warrior clan. They would ally themselves with the Kaiel as a fighting arm, and with their force unite all of Geta in but one generation. We talked all night and they lusted for more than my body. They lusted for all of Geta, they lusted to walk upon Scowlmoon, they lusted for the stars and I felt their passion to the depths of me."

"Power-lust will always be with us. It is the way of the human."

"But this is the very way that God has warned us against! There are many ways! I would take God's way. I need your help!"

"The decision is yours."

"Aesoe outreaches Hoemei three to one in the number of his Kaiel allies and two to one by voting strength. Kathein has sneaked away from Aesoe for Sorrow under cover of night to take the maran in marriage in open defiance of the law. The maran will be destroyed. I do not have time to make a wise decision!"

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"But you contemplate a decision you consider to be unwise and expect me to save you by countermanding it. You would deny the Itraiel their warrior march among the stars in exchange for a gift to Hoemei of one cactus bloom picked at the full fragrance of high-node."

"Yes. I would do that."

The eyes of the crone glinted. "The right decision is always best no matter how painful."

"The *right* decision!" exploded Humility. "Yours or mine!"

"Neither. This is a test of your kal-othi. I gave you one week of power over the destiny of Geta for the next thousand generations. See what you come up with. I repeat, the decision is yours."

"You and your illusions that we dong-kissers rule Geta!" stormed Humility in open rebellion, jerking her finger upward at the tower. "Our rayvoice doesn't even speak today! At the library I tried to find out the numbers of the Itraiel and no one knows. And you want me to make a decision in the flutter of a heartbeat that God has pondered silently since before you were born!"

"It was ever thus."

"The crones will accept the *consequences* of my decision, whatever that decision?"

"Of course."

"Good!" She stamped and left, the fabric upon her small body fluttering in agitation behind her.

55

At the time of the destruction of the Arant, the cynic Miosoenes spoke of the rulers of men as the candles we blame for causing our stumbling in the dark.

From "The Cynic's Compendium"

The party pulsed with Aesoe's pulse, beating at the skull's temples to the music of God. And Aesoe took the stage of his celebration to reveal in compact speech his newest Racial Future, every word arranged for the cymbals of oratory so that Vision seemed to blend with the dancing.

At his side was the faithful Liethe woman known to the Palace as Sieen. His friends were glad she was there to fill the void of Kathein's abandonment. Sieen was the symbol of the continuity of loyalty. She praised her man. She defended him. She advised him. Tonight when the whisky was poured, she added color to his Vision by describing troop carriers, longer than planets, stuffed with loyal kembri scarredmen as they slipped across nebulae to bar the reaching Riethe. Aesoe smiled at this dream, vaster than any thoughts of Hoemei.

After the celebration, Aesoe's gaiety vanished into morose depression. Humility, long able to handle the complex persona of Sieen, undressed him, massaged him, oiled him. She chattered to fill his silence. "You were great tonight. I saw! As you talked every Kaiel grew by a full thumb-height!"

"I'll have to work on Xoniep's report tomorrow. God's Nose, and early, too."

"I have it memorized. I can tick off the essentials whenever you wish."

He laughed. "I need a hundred more like you." But a secret thought caused the relapse of depression. He stopped Sieen's hands, got up, went to his study.

She knew he had chosen to stand and

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stare at the portrait of Kathein and think his thoughts. It was not a true likeness, but clever paint that put into her face the strength of character that Aesoe wished she really had.

Humility left for the bedchamber, calculating the necessities, here the pillows fluffed, there the curtains parted to make best use of the dawn light he would never see again. She undressed and chose to wear only the golden ankle chains with their dangle of jewels, gifted to Sieen by Aesoe and worn now by a dozen se-Tufi Sieens, that faithful myth who loved him so much he could do no wrong. He often chided her for her tolerance of his foibles.

She recited the cue mnemonic of the Attributes of the Male as keyed to Aesoe, checking out every detail that might facilitate his pleasure. She arranged the candles. She brought down the delicate goblet that Kathein had given him, cold with the soft blue of fine glass. Her other fingers took hold of another chalice, a gift from the Prime Predictor that had brought tears to the eyes of some Sieen long ago when Aesoe had been a more thoughtful man. She found a bottle of common Oza, a liquid as pale blue as Kathein's goblet, pale as the dew on the flowers of Assassin's Delight. How he loved this common Oza that was brewed in a thousand cellars!

She fluffed her hair and styled it with silver combs in fantastic shapes that would not keep by themselves. All to be beautiful for him. She chose a position on the pillows from the Bewitchments of Form, plucking her instrument with a calling sound to seduce him from Kathein's portrait as the green bower of a desert well calls the stricken traveler.

"God's Sweet Smile but you're ravishing. I'm the wrong man for you. Tell your crone to demand more coin." He stood by the door, the riot of his fierce cicatrice somehow muted.

"I am happy. There will be happiness for you, too. Kathein will come back." Her words triggered the rage to the forefront of his eyes. Protected by the White Mind, she did not react as she read those eyes. *The decision to destroy has been made. Hoemei, my love! Hide! Hide!*

"Kathein return to me? I see no such vision."

"You do not know women. Hoemei is a fantasy to her. She's in love with a sinewed man who can reach as far as the stars. I know. Hoemei will disillusion her. She will be back. She will cry and the tears will yet wet your feet and roll between your toes because she will be sorry and you will forgive her because you love her." Sieen changed the tone of her voice from hope to doom. "But if you destroy Hoemei, her fantasy will stay intact and her emotion will set like lava cooling to stone. I caution patience. Wait. Calm yourself."

Humility's anguish was great at the telling of these lies.

"It will take too long." He made the gesture of impatience. "I cannot wait. I am too old."

"One week. It will take no longer."

"You dream!"

Sieen smiled as the prophetess smiles. "I promise you."

She could see the tension drain from him before he spoke. "I will give him one week."

She abandoned her stringed instrument. Arms about his neck, smiling, she reached up to kiss him, not as a proph-

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etess but as a lover. "In the meantime, I'm glad to have you all to myself."

He laughed and lifted her feet up off the rug so that the kissing might be easier for her. He carried her body to the pillows. She squirmed away.

"Some Oza first!"

"Oza! When I have you?"

"It clears your head. It cleans your bile. Besides, it sweetens your mouth so that you are all the more kissable!" While she spoke, she was pouring the Oza on top of a single dew drop of the essence of the blue petals of her Assassin's Delight. This poison did not survive in the body and so could not contaminate the Funeral Feast. She handed him Kathein's goblet. Liethe fingers took her own.

"To love," she said. "May we live long enough to taste all of its pleasures!"

He drank. She drank. He flirted with the jewels at her ankle. She took him in love, knowing exactly how much time she had. Every motion was Liethe perfect, the touches, the pauses, the rhythm, the sighs. Clumsy Kathein had never honored him so well. "Remember me my love. Remember our heartbeat of time, for in the end there is only this."

"My little friend," he said and pulled her to him. The union was so complete that her shudders felt the very poison in his blood. Tears came and he kissed her eyes.

She was holding his head in her lap, tousling his hair, whispering endless nothings while the fuzziness that he thought was alcohol came upon him. His hand jerked. "Sieen. My heart!"

She found no last words. He died. She bawled. Of what use is the White Mind when you are alone with a dead lover? For a moment she calmed herself enough to remove all evidence of the crime. Then she went back to the pillows and hugged the corpse and did not stop crying.

"Oh Aesoe! Why did you break the rules so often?" Sobs caught her again. She pulled her voice into a half-choking, half-lecturing tone. "You can break the rules but there are consequences. Didn't your teacher ever tell you that? Silly man." She talked to his body, to herself, affectionately patting Aesoe from time to time, pulling the covers over him so he would not get cold, kissing him.

"I'm sorry. I wanted to figure out another way. But no one helped. I didn't know how. Why do we always use the solutions of our training? You too!" she scolded. "I don't want to kill people. I want to love them!" She touched her lips to the still-warm lips. "You were a great man and I loved you and I'm mad at you!" She tried to surround his cooling body with her body to give him warmth.

But in the morning she woke beside a statue of Aesoe done in alabaster, a low relief of symbols carved on its surface. She ran her finger along the cold stone and there were no more tears.

56

Brilliant by night, bright enough to be seen by day, God passed seven times between sunset and sunset for two hundred days to watch my Trial, to guide me across the roadless Kalamani

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for I had no maps. The Kalamani is no place for man. I slaked my thirst by distilling the juices of insects. My comrades died and there was no one to honor their flesh but me. Life was chewing the sun-dried strips of their life. All honor to my comrades!

Harar ram-Ivieth from his
"Following God"

Most of Kaiel-hontokae seemed to be at the Funeral Feast. The tables of food at the Temple of Human Destiny would have ended a famine. The great gongs never stopped sounding. Below the stained glass, Aesoe was the steaming centerpiece, skinned, dressed, decorated, roasted, no longer human. The entertainment that whirled around him never ended. His three Liethe danced for him a mourning song that crawled from the blacks and browns of a dirge to the ebullient roses and reds and pinks of birth. Aesoe's little children fluttered about being important, serving the food, keeping order.

Men gave speeches and men wept, cooks rolled in carts of food, choirs sang, whisky flowed, robed Kaiel flowed about their temple like trapped floodwaters from a sudden melt.

The Queen of Life-before-Death found herself huddled under a table to avoid the crush, savoring her own small strip of Aesoe, dreaming dreams, feeling his strength. She saw a black and purple robe pass by and grabbed at its legs. The wearer of the robe looked down. She peered out smiling.

"I'm Honey—just in case you didn't recognize me."

"Who but Honey would be hiding under a table?" grinned Gaet.

"That's a *hat* you're wearing?" she exclaimed. "What are you doing here?" she asked breathlessly.

"I thought Polite Form required my presence. Traveled my bum off nonstop by skrei-wheel. God's Laugh if I won't be bowlegged for weeks! Wasn't sure it was safe for Hoemei to come. Joesai is in the bush somewhere chasing his tail and Teenae didn't even want *me* to come."

"Did Kathein reach Sorrow safely? Aesoe was so upset!"

"If it didn't give him heart failure! Kathein's arrival was a surprise! There will be a wedding when Joesai and I get back. This unfortunate Feast makes it easier."

Honey pulled Gaet's head down to her ear level. "You're such a hypocrite," she whispered. "Why do you say 'unfortunate' when you mean 'fortunate'!"

"Not 'hypocrite'; the word is 'diplomat'," he corrected. "Let's get out of here. They've run out of meat. Funerals are a pain when there are more than twenty people. Never get enough to eat."

"May I just go with you? Just like that?"

"I give shelter to the unemployed. My humble home?"

"God yes. Is it still standing?" she teased. "I thought the Expansionists might have burned it down by now."

Halfway there she couldn't resist the question that was dominating her mind. "Do you think they'll make Hoemei Prime Predictor?" She was clinging to Gaet's arm.

He grinned and bumped her hip af-

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fectionately. "I think you like my brother." He was teasing.

"I want to know!"

"Yes. It is checkmate. Hoemei was blocked every which way by Aesoe. Aesoe was the key piece. So the Black Queen took him off the board and now it is a new game, and I believe Hoemei has control."

Gaet escorted her through the maran's darkened city mansion. In his room, without any preliminaries, he brought out gold coin in prepayment for the sexual favors he was obviously expecting. She stiffened. Suddenly their camaraderie was gone and she felt alone in the whole universe. "That's not the way it is done," she said coldly. "All money matters are handled by the crones. A gift as bonus might be welcome if I were to please you enough."

He laughed while he undressed. "I offer my apologies," he said without being the least contrite. "I'm used to the way wives handle their husbands."

"I'm not your wife!" She was surprised at her anger.

He was staring at her as if she were a child on the auction block. "You could have been. Hoemei really loved you. He wanted me and Joesai to love you, too. We were very short of a woman then. It is hard for two women to keep up with three men."

He was making her more angry. "The Liethe *never* marry."

"I know. So does Hoemei. He's a family man and not an old reprobate like me."

She pushed his money back across the table.

"I was just cutting out the middleman. The crones will never know. Consider it an advance: my invitation to Sorrow to dance at our wedding."

The anguish was there again, and indecision. She knew she would do anything to see Hoemei again, just to pass him in the halls of Sorrow's Temple, anything. She'd walk across a world to spend an evening with him.

Gaet threw up his hands. "I can't argue with you. Not now. I'm dead on my feet. I didn't think I'd make the Feast." He turned around and fell like a collapsing building onto the pillows and was sound asleep, still half dressed.

She stared at him, no longer angry. *Perhaps he thought I was out of a job and needed help*. He would not comprehend the ethic of the hive. She wasn't used to friends. She moved the gold coins with her fingers. Impulsively she tidied the room. Gently she finished undressing him so that he would not wake. She put his things away. She put her own gown away, and the money with it. By the time she found courage to sleep with him, he had the pillows well toasted. It was cozy under the covers. It was good to sleep with a warm body again.

57

The multiple apparitions of our futures fight their spectral game on the deadly field of the present, destroying one another, until, heartbeat by heartbeat, the victor comes alive, takes on substance, mass, inertia, the glory of a summer form or the cancerous monster of some mad being, the very warmth of his solid body dissipating the wraiths of the lost futures—to reign in ephemeral glory for a day before twilight

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makes of him the corpse upon which the next phantom battle begins to rage.

From the essay "Futures"
by Hoemei maran-Kaiel

Noe found Gaet and the Liethe woman beside the road where they had been resting and eating bread. She parked her skrei-wheel next to theirs and crossed her arms to warm herself against the flowing fog.

"I wasn't home when your wirevoice message came through."

She was glancing at Honey. Gaet could sense her distress. He rose. "You forgot your cloak. You're cold."

She shrugged. "I thought you were alone."

"I brought Honey to dance at our wedding. She's been a good friend to Hoemei, more loyal to us than to Aesoe. Somehow with his death it seemed appropriate to bring her."

"You have a flair for complicating matters!" Noe's voice was the sting of a bee.

Listening, Honey pulled her black scarf around her face, like the sheathing of a beekeeper, but imperturbable eyes watched Noe. The Liethe woman's very demeanor chastised Noe for her bad manners.

With a flicking gesture of impatience at Gaet, Noe turned to sit beside the woman who had been the sensual of her husbands, reaching into her pack for bread to feed both travelers. "I'm not myself. I welcome any guest of Gaet." Her voice was briefly warm again. "You may have come in vain. There may be no wedding."

"Eh?" Gaet queried.

"You," Noe turned savagely to one-husband, "may not even find a family to greet you!"

Gaet was diplomatically inserting himself between the two women. "I see I'm behind on the gossip. Has Kathein changed her mind again?" He laughed. Then he caught Noe's bitter mood for the first time, and the fog clutched his heart. "Someone has died?"

She took his hand and kissed him on the cheek, then compulsively put spread on a slab of bread for the silent Honey. "Joesai is home."

Gaet grunted. "Since when is that bad news?"

"He brought *Oelita* with him. He found her in the desert, mothering twins by Hoemei."

"Ah," said Gaet. "She'll be welcome in Sorrow." There was more to the story. He waited.

"Joesai expects us to marry his Heretic."

Gaet laughed the great laugh. He could not restrain himself, even to match Noe's mood. "Did Joesai bring her in tied to a pole and drugged?"

The answer carried deep puzzlement. "She loves him."

"God's Sky!" said Gaet.

"Joesai and Hoemei have been fighting. I've never seen rage like that. They're brothers! I was frightened. Teenae was terrified. She and Oelita ran away to the village and left me and Kathein holding the stewpot. Kathein wants to return to Kaiel-hontokae." Noe was crying.

"Shall I speak to Hoemei?" said Honey with great concern. She reached across Gaet to comfort the sobbing woman. "I have certain catalytic powers."

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"You stay out of this! You'd steal him from us!"

Gaet slipped his arm around one-wife. "Your foul mood staggers without reason. Our Liethe friend will steal no one. They are a gentle clan, and Honey is the gentlest of them. Their place is to serve. The Liethe are known to be incorruptible in the purpose they have set for themselves."

"Speaking to Hoemei would do no good," said Noe, disconsolate. "My husbands have lost their reason."

Gaet laughed. "Such is the price we pay for having women in our lives. I'd best end my rest and begin the peace-making process."

"There will be no peace! Don't you think we've tried?"

Gaet was staring at the wind-shaped trees in the gully beside the road, trees older than any man alive, short trees which had fought off the violence of the sea a thousand times and stayed rooted. "I think it was Hoemei who taught me when we were still in the creches that when a problem is insoluble, then it is essential to change the problem." He rose. "I'll go alone. Both of you join Teenae and Oelita in the village."

Gaet pushed his way through the trail to the maran's coastal mansion, cursing the bump that had put a wobble in his wheel. Another job, retensioning the spokes! For a moment he stopped to examine the damage, but also to give himself time to think out his attack on his brothers. He turned the skrei-wheel upside down.

The maran were a strange group, viable because of the different substance of their individual abilities. Gaet knew that most of the world saw him as the easy-going lackey of his family. If Noe wanted to go to the theater, he would go. If Hoemei had a political deal to make, Gaet would negotiate a resolution of the conflicts. He was known for his pleasures. He was too pliable to be seen as a strong man. And yet this family was his creation and he valued it above all things in his life.

He spun the damaged wheel and watched it wobble. That was his skill—retensioning the spokes.

He sat in the mud of the roadside with only the glow of Scowlmoon through the fog to illuminate his work. Suddenly he was laughing. His shy brothers, who had never met a woman without his help, were fighting over women! How he would roast their legs in sauce! Joesai, once recklessly in love with Kathein, felt her betrayal the strongest—and now was hopelessly attached to a woman he had tried to kill. Shy Hoemei had been slowly seduced by an intrigued Kathein, almost running from her; yet when she left them, it had been Hoemei who had stolen her back from his arch-rival Aesoe, perhaps the only really reckless thing he had done in his life. He wouldn't be willing to give up a victory so at the heart of his manhood. Gaet sighed; it seemed to be his fate to sort out the quarrels between Joesai and Hoemei.

There were the children, of course. He smiled. Joesai was allied with Oelita but was the father of Kathein's Jokain. Hoemei was allied with Kathein but was the father of Oelita's twins. With such a bludgeon he might not even have to argue verbally with his brothers to bring peace to the family again!

* * *

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58

One who chooses the route of mutual help has no fixed goals because he constantly explores the goals of others and so modifies his own. Such a wandering road leads to loss of individuality, but such a person always finds a land where there is a rich choice of futures and so his gains are greater than his losses.

Prime Predictor Tae ran-Kaiel
in "Bargaining"

In the morning, after traveling back and forth between the maran mansion and Sorrow's inn and carrying on a great number of conversations, Gaet rented a sailboat to take Oelita and her boy and girl up the coast to the bay of the Old Man, the Mother, and the Child of Death, leaving Noe and Teenae and Honey in town.

He had convinced Oelita that Hoemei would take good care of their twins. Gaet had little knowledge of sailing and gave command to Oelita, who remembered her sailor motions as if she had never left the sea. He spent the journey telling her some of the finer points of his negotiations. The crisis had come when the boy Jokain placed the pinnacle on his edifice of blocks. "Jo and Kath fight," he had said, and with the back of his hand knocked down his building with one sweep.

"Then what did you say?" asked Oelita, her attention mostly on the breeze.

"Just the usual. I asked him what he thought families were for, and I told him that we take care of each other when bad things happen like fights. I told him that he would be taking care of Jo and I would be taking care of Kath. He doesn't miss a thing. He asked me who was going to take care of Ho. I told him I was going to send the twins to make him smile."

They beached beneath the maran mansion. Gaet left a bewildered Hoemei to manage as best he could with two squalling children. Kathein, who had already been brought into the conspiracy, gave him firm instructions and, perhaps apprehensively, followed Gaet back to the beach.

"I've never been in a boat before," said Kathein, "not even to cross a river."

"You'll like it!" Oelita said with a smile, as she helped her rival aboard, glad that she was in command.

"Tell me what to do," said Kathein.

Gaet was shoving the boat out into the waves again. "You should know all about the forces of tacking."

"The boom adds and subtracts on its fingers faster than I do!"

"Where to?" asked Oelita.

Gaet climbed aboard, dripping, helping Oelita hoist the sail. "You once told me long ago that you found the Frozen Voice of God along the shore near here when you were a child."

"I know exactly where."

"I thought it might be a place to picnic. *The Forge of War* is the common meeting ground between you and Kathein."

Kathein's eyes brightened. "Do you really remember where you picked it up? That's very exciting!" The boat was gathering speed, splashing a fine spray into her face when they crossed a wave. That was exciting, too. "We've never

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found more than the one we had and yours."

"The cove has a sandy bottom. A lot could be buried there."

"Maybe God will nudge your hand again."

"We'll try. It is a wonderful place to swim."

"Is swimming in the sea different from swimming in a pool?"

"Oh yes. I'll show you how."

The cove was isolated and protected from the storms and, because of that, sheltered peculiar kinds of insect life. Oelita remembered why her father had been here, and found a green-backed digger for Kathein and then a whole colony of tunneling insects with peculiar clawed eyes.

The two women shed their sailing clothes and began a diving exploration of the shore bottom. Gaet built a fire on the sand and roasted a lunch in bundles of leaf packs. He watched the swimmers, pleased with the emotional smoothness of his venture. He could relax now and worry about trivial details like the penetration of the leaf aroma into the food.

Women were beautiful in different ways, he thought, watching them. The artists of the coast had used simple designs over Oelita's flesh, leaving sweeping areas of plain or lightly etched skin for contrast. Kathein was decorated more in the high fashion of the Kaiel: delicate work, lavish detail, symbols, intricate dye work overlaying the scars so that not a patch of child's flesh remained, showing her to be a true Master of Pain.

He spread mats on the sand. With the sun at highnode and the fire to dry them, they did not bother to dress when they returned. "Did you find anything?"

"No," said Oelita. "There's growth down there, more than when I was a child."

Kathein laid up her wet hair on a lattice of fingers. "Sea life entrances me. I learned to swim with my eyes open! I'll have to bring a dredge up here sometime. It's a shame. I wonder how *The Forge of War* got into the sea? There is no sign of ruins or an old boat, or anything at all down there."

"I'm glad you brought us," said Oelita. "The problems of our men seem very remote out here. We've been talking about that."

"Between mouthfuls of sea!" laughed Kathein.

Gaet unwrapped a leafy fist-cake and let them smell its steamy fragrance. "I'm working on a compromise that will satisfy us all. I need new information. You two will have to be my source."

"Do you want to know how Joesai feels?" asked Oelita.

"No. I know Joesai. I'm not sure I know what drives a Gentle Heretic."

"You know *me*," said Kathein.

"You're positive?" asked Gaet. "You've been with Aesoe a long time."

Kathein dropped her eyes and Oelita took her hand and confronted Gaet for both of them. "What do you want to know about us? Just ask."

"Let me go over some family history first. We've had a Five that works well. I didn't really understand it when I started it. A family was a misty dream, something to do as I climbed the ladder of Kaiel tradition. I was told that the bonds of a family created abilities that no single man could aspire to by him-

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self, and I wanted to do everything—and be everything—and so a family was just a natural extension of myself."

"Do you think of your family as beginning the day you met Noe?" asked Kathein.

"The day I met Noe was a disaster. Whatever happened began the day Hoemei and I met Joesai."

It was Joesai who had delved into the creche's genetic records. Tae ran-Kaiel had authorized experiments in an attempt to create a predictor as powerful as himself. One of them had involved breeding himself with one of the early successful predictors, a Gaieri ma-Kaiel, whose sperm had been frozen in nitrogen yet never used because he was a known carrier of multiple lethal recessives. Up to four million different homozygous *female* individuals—sub-clones—can be formed from one heterozygous male. Such a sub-clone of Gaieri was their mother. About the age that a child first learns to walk, she was artificially matured, butchered, and her ovaries used for further experimentation. She became, in this indirect fashion, the genetic mother of nine of Tae's children. At the time Joesai read the records, four of that batch were still alive: Sanan, Gaet, Hoemei, and Joesai. Unilaterally, Joesai sought out his brothers and began to protect them for no more reason than that he felt their kalothi was somehow tied to his own.

"We didn't even like him," mused Gaet to Kathein and Oelita there on the beach. "We made fun of him. We taunted him."

"You made fun of him? And he was helping you!" said a saddened Oelita.

"Poor little boys," said Kathein.

It wasn't long before they were impressed by their alliance. Gaet negotiated them out of trouble, Hoemei anticipated trouble, and Joesai fought them clear.

"What I'm trying to say," said Gaet, "is that the ugly fight you've witnessed is nothing new. We've always fought. Noe and Teenae are a little frightened because the worst of our conflicts were over before women came into our lives and so our wives still don't understand the roots of our fights. You two aren't used to them at all."

"When I met your Five you were very happy," said Kathein. "I loved your happiness."

"A baby learns to walk. Every other step was a disaster no matter how hard we concentrated—and then suddenly we were running and we were such a good team that our services came to be in high demand."

"I thought you were the smoothest people I knew," Kathein said, laughing.

"So did we. That's the danger signal. As soon as you learn to walk so well that you can run over rough ground, then you want to fly and you break your bones in your first sailplane crash. We hadn't counted on Aesoe."

Oelita broke her silence. "Joesai told me that one day Aesoe just ordered you to marry me."

"That's the way it was. We were outraged."

"He wanted me," said Kathein contritely.

Gaet grinned. "He gave us a fair trade. Aesoe had excellent taste in women!"

The women stared at Gaet and he

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knew the question that each was asking him with her eyes but was unwilling to speak. *Which of us do you prefer?*

Gaet paused solemnly. "We have arrived at a conflict of futures. The five of us learned to love you, Kathein, and I think it was mutual—and then you left us and we still loved you but we began to look at alternatives. The five of us didn't want you, Oelita, not because we didn't love you when we met you, but because you had been imposed on us against our will."

"And against mine," she added.

"But wasn't Aesoe right? You could have become part of a functional Six. Still, Aesoe's vision went awry and so we have this situation in which two futures try to occupy the same present. The five of us cannot resolve this conflict. It is up to you two."

"We're back where we started," said Kathein, almost angrily.

"You cannot ask that of us," said Oelita.

"We could flip a coin," said Kathein bitterly.

Gaet was smiling. "Do you like each other?"

"Of course we like each other!" flared Kathein.

Tears were running down the ridges of Oelita's facial cicatrice.

"Could you live with each other?"

A look of astonishment crossed Kathein's face. She turned to Oelita. "Do you know what this man is proposing?"

"No."

Kathein was on her feet. She was dressing. "Poor Hoemei and Joesai are back at the mansion feeling miserable, and this lecher here has the audacity to think he can have both of us."

"I don't believe it!" said Oelita, staring at Gaet's face. She saw it was true and rose with Kathein to dress, too.

"It's one solution," said Gaet, admiring two women he loved.

"But a Seven is illegal!" exclaimed a shocked Oelita.

"By custom, not by law. With Hoemei as the Prime Predictor it would hardly be a problem."

"Where were you planning to take us? I know you! There must be pillows around here somewhere." Kathein was sarcastic.

"The Temple of the Gray Rocks. It's small, but it has a charming game room. What better place to spend the night?"

"See!" said Kathein indignantly. "See how easily he betrays his brothers!"

Oelita was still staring at Gaet, remembering all the lonely nights, the suffering, the string of lovers who had been her fate because of her vow never to marry, the fear she carried with her which even the peace of the desert had never mollified. She began to speak firmly. "Joesai and Hoemei have fought. Let them suffer. At the creches they would have a name for it: the Trial of Stupidity. Kathein and I have not been fighting. We've only committed ourselves to loving, and challenged our fear to find that. We deserve our pleasures. Gaet, I'll go with you." She turned her eyes to Kathein defiantly. "I love this man. And I can live with you—because I love you."

59

Until her hair has gone to gray

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A woman will not know to say
That all of loving's painful play
Was worth the joy of every lay.
From a Liethe drinking song

Like a black cloud across the stars, a shadow passed into the yard, examining the stairways and balconies and the footholds in the face of the wall. The Queen of Life-before-Death clutched the black shawl that made her invisible by night.

Gaet had left her with women and she was resentful. She wanted to be with Hoemei. It was her duty to be with men. Her knees were like jelly knowing this was the most important night of her whole life.

She heard sea noises. She was a wave rising as it ran toward shore at the very heartbeat before it crested, foaming, roaring, to lay itself on the beach.

As silently as God flowing across His Sky she moved up the stairs. With an assassin's stealth she stole through the window-door open to the night breeze. She knelt beside the figure on the pillows, colored by the pale reflection of a waxing Scowlmoon across the sea. She longed to touch him but pulled her fingers back. Hoemei. This was the man she intended for the highest position on Geta.

His sudden darting hands reached out to grab her by the arms, paralyzing her.

"It's just me," said her soft Liethe voice.

"What are you doing here?"

"I came to dance at your wedding."

"You're early."

"No I'm not. I'm your beloved Honey."

"You gave me heart failure. I thought you were an assassin for the Expansionists."

"They've hired me to enchant you and take you away with me to the North Axis where we can go around in circles together for the rest of our lives and not bother anyone."

He dismissed the notion. "Gaet must have sent you," he sighed.

"I have a present for you." She brought out a tiny strip of dried and salted Aesoe. "Eat it. It will make you strong. I have a gut feeling that you're going to need all your strength."

He looked at her, wondering at the symbolism and the smug smile on her starlit face. "Are you thinking that they'll make me Prime Predictor? Have you been listening to gossip at the Archives?"

She stuffed the fragment of Aesoe into his mouth. "That's not the kind of strength I mean. Silly. You're going to need all your strength to make love to me—now."

He munched and laughed. "Be a good woman and tell me what Gaet is cooking. I have a shortage of spies."

"Ask Joesai."

"I'm not speaking to him."

"Gaet ran away with Kathein and Oelita. He was looking very hard-crotched. I think they are off to the South Axis to be away from us mortals. I couldn't bear the idea of you being left alone—so I came to console you."

"Hmmm. Do you still have your job at the Palace?"

"No, silly. Not unless you hire me after your triumphant return to Kaielhontokae. If you love me, you'll hire me. Do you love me?"

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"Only a besotted fool loves a Liethe." He was undoing her black robe.

He wasn't shy anymore. He had changed. She liked his hands. "Are you a besotted fool?"

"All kinds of a whiskied fool this last week."

"Do you have remorse?"

"Yes."

"Let me make you feel better."

She prolonged the loving of their bodies until the moon was three-quarters full. Then she couldn't hold her grief in any longer. She let her fingers run over the rough texture of his scars and sobbed. "You forgot me! You left me all alone! You didn't care! You don't think about me because you know you'll always have me!" He rocked her and patted her and kissed her tears away and she liked that. Rocking her, he rocked himself to sleep. She watched him wide-eyed, loving him.

Happy now, she rose stealthily to her feet and unhooked a covered globe from the wall. In the corridor by the mirror she unwrapped it to fix her hair so that she might be less mussed in her beauty. The bioluminous glow was dim enough for her to think to feed the globe and clean the scum from its filters.

Then she brought herself to Joesai's room where she smashed her toe on one of Jokain's wooden toys and, biting her tongue, found a place above the messy desk to hang the globe. She read some paragraphs of what Joesai had been writing. It was the sober list of attributes that a warrior clan would have to possess. She sat near him on the pillows. He was a sounder sleeper than Hoemei, and she had to pull his ears.

"Ho!" he started.

She rubbed his chest gently. "I see you still wear the amulet I gave you."

"It has brought me luck."

"Not luck. It has magic Liethe power."

"How did you get here?"

"You were dreaming about me and the amulet summoned me. It's a superior way of travelling."

"What was I dreaming about?"

"You were dreaming about making love to me!" She kissed him.

"I don't believe you. I must have been dreaming about Comfort."

In the swinging light she seemed to smile like an apparition and touched the carved charm to her breast. "I *am* Comfort. I told you when I gave you the amulet that it would protect you. All you had to do was need me and I would be there, pazam! just like I'm here now! I take on different names depending on my mood." She straddled him.

"Ho! I've never heard a more unlikely story. How do you travel so fast?"

"I don't; I live in the amulet," she said mischievously.

"So that's why you are such a small handful."

She had not wanted to talk to Hoemei during their body loving, but she wanted to talk to Joesai. "You're beautiful." she said.

"I'm ugly."

"You're my master!"

"That's why I'm underneath."

"I'd like to be your woman at your Ritual Suicide."

"I'd rather be your man at *your* Ritual Suicide."

"Do you like se-Tufi women?"

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"I'll take three of them at the breaking of fast, slow fried."

"What was it like to make love to Comfort?"

"She poisoned me!"

"I love you."

"Now you're getting wax-mouthed."

"But I do!"

He had to be silent while he held her in the final heaving embrace. He sighed. She kissed him, wet little kisses while the tension went out of their bodies.

"You can go back into your amulet now," he said.

"No," she teased.

"I was afraid of that."

"You have to come with me." She unhooked the bioluminous lamp in one hand and pulled Joesai to his feet with the other. "Every pleasure has its price!"

The smooth-skinned Liethe with the sapling legs and rounded hips and firm small breasts and laughing face dragged the fiercely symboled Kaiel giant down to Hoemei's quarters. Two naked brothers confronted one another guiltily.

"You have to hug each other!" she ordered. When they did, she made them hug her, too. She cried while she dressed—a wave finally smashing into the beach—and disappeared into the dawn.

60

One is at the Center;
Who but One creates?
Two are on the edges
Binding inbetweens.
Three, the vertices
Holding plane intact.
Four, a pyramid, makes
Solidarity.
Five, the human senses
Fill us up with life.
Six points of kalothi
Letting life persist.
Seven Godly forces
Pass between the stars.
Eight is not a number
Spoken of by Death.

The Numbers Chant

Weddings had serious moments but mostly they were times for fun. Music welled from a row of Chanters wearing resonant facemasks that changed the trained human voice into a vibrant instrument able to handle the deepest rumbles or highest trills. Six tumblers, three men and three women, slipped into the great plaza of the Temple of Sorrow in mock wedding finery, one malevolently tripping another to be caught by a third, to be tripped himself and caught in a cycle of marital quarrel and assistance that accelerated into a dazzling display of body throwing.

A rustle of attention fell over the audience as the members of the real procession found seats. Kathein, in the lead with Oelita, wore a robe of red, slit vertically, blue-dyed hoeila wings showing through the slits, and a headdress of hoeila wings with silver inlay for her facial cicatrice. Oelita wore white Orthei lace with white paint along the ridges of her facial design, and a tall crown of white lace.

Hoemei followed in more subdued attire, a black-and-gray-striped skirt with billowing blouse of gray sheen, open at the front to show his scarred chest, the wingflaps of his bronze hel-

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met sweeping so low over his shoulders that he could not tip his head to either side. Beside him, Teenae wore an elaborate headdress that began with a green insect crawling down the shaved centerline of her skull on a hundred comblike legs that wrapped her black hair in jeweled coils. The valleys of her facial cicatrice were dyed black. Her blouse was white and close-fitting with slit sleeves held at the elbow by silver chains. Her pantaloons were black and flaring around the hips. They, too, were split at the back, from waist to ankle, the valleys of the designs on her buttocks and legs painted in white. Silver chains held the pantaloons together.

Joesai, in the center of the Five, was dressed in what he thought to be the court finery of an Imperial Chinese Warrior of the Han Dynasty. It was immaterial that the colored insects embroidered into his blue coat were Getan and not Riethe.

Noe's hair was wound into a silver cage like a nest for the insect that sat there with lustrous blue-green wings and eight silver legs and four green eyes. A bolt of the finest white silk hung over her body but left her sides bare to show off the exquisite skin carvings along her ribs and hips. Metallic insects, holding hands across her waist and clinging to her legs, held the garment together. She gripped Gaet by the arm.

He wore top hat and tails, a costume he had copied from a picture of Abraham Lincoln. To enliven the effect he had added tassles to the top hat and wore a rubied nose ring. Platinum wire, set with tiny rubies, held to his facial scars, furred with a short beard dyed green. He thought he made an elegant groom, a Mormon perhaps.

When the tumblers had finished their acrobatic act, men with casks moved among the crowd pouring a sweet punch touched by the flavor of whisky while the Chanters began a light melody that pranced through the party almost unheard above the laughter. The sun was setting.

At the very moment God appeared in the purple sky at the horizon, a Liethe woman slipped out of the Temple unnoticed, shifting in happy steps, dressed in a luminous sun-orange and white with a bridal crown. Hers was the hesitant motion of a blithe woman unused to such happiness. She ran and stopped. She skipped. She leaped—and had the full attention of the audience who wondered where she had come from.

Her suppleness was the merry frolic of a girl recalling moments with the husbands she loved, a blush, a touch, a tryst. She bounced in a way that made her audience gasp, as if she were free of gravity. Gradually, she moved out among the people, dancing for an awed child, or she would take an old man for a partner and prance with him until he was young again, or climb mischievously to the shoulders of an Ivieth. All the while, as the twilight deepened, she spread her magical cheer over the wedding guests.

This was the first ascension of God in the week of the Reaper in the year of the Spider. Weddings were always timed to begin with God on high so that He might witness the ceremony. The crowd began to hush as God rose toward the zenith of His Darkening Sky. The dancer vanished. The Chanters became

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silent. A few stars peeked through the cobalt blue vault of the heavens. A woman pointed out Stgi and Toe to her young son. The insects clicked and rustled even here in the middle of the town. A baby cried and was hushed. An old woman coughed. God moved, His Tiny Beacon brighter than any star. All eyes were on the Streak. Suddenly, at the very moment of highnode, the Wedding Chant resonated from fifty masks.

"And the God of the Sky;
The God of Life;
The God of Silence
Brought us to a harsh land
That we might discover
Loyalty!"

Fifty right hands which had been raised beside the masks came down and drew the sign of loyalty between the Chanters and God. The seven Kaiel who were making Union were now in the center of the plaza and dropped their eyes from God to themselves. They were silent, motionless.

"And the God of the Sky;
The God of Life;
The God of Silence
Waits in the quiet blue
For your seven signs
of Loyalty!"

Each of the maran, and the maran-to-be, raised their right hands, fashioning the gesture of loyalty that bound them to each other. Teenae's eyes flicked to Oelita and Oelita looked from Kathein to every maran in turn. Noe thought about loyalty and thought she was beginning to understand it. Joesai was thirsty and his coat was uncomfortable. Gaet admired the beauty of his women. Hoemei was at one with God, at peace with himself, and in love with his family. Kathein wondered if she would make a good wife.

The masks resonated again.

"And the God of the Sky;
The God of Life;
The God of Silence
Who returned our lives
Asks your witness
to Loyalty!"

The crowd, as one, raised their right hands and made the sign of loyalty in the air before their scarred faces.

The chanting changed again to the Call of the Bonds. Each of the brides and grooms were given a colored twine and they began their stately weaving dance that let them touch and smile and bow at each other and twist and turn and jump and duck in such a way that they braided the Cord of Seven Strands that was the legal evidence of their marriage.

It had become dark enough for the newly installed electron torches to be switched on. The people of Sorrow, who were not used to such marvels, gasped when the yellowish light turned the plaza into a cloudy day and left all else in shadow.

Next came the giving of the Five Gifts. The already married maran each had a token gift for their newlywed wives. Oelita was given a platinum ring, an ebony spoon, a tiny carved spice box, a golden pen, and a comb. Kathein received a tiny mirror so curved that it showed her a miniature of her whole face, an anklet chain, a polished fossil, a bone of her grandmother carved into an ikon by one of Sorrow's best artists, and sapphire earrings.

The brides returned these favors with food, grall for the men—a kind of hard pastry built up in alternate sacred and

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profane layers and cooked the night before the wedding—and honeycake for the wives.

Joesai was grinning as he eyed Oelita's grall offering skeptically. "I remember you threatening to poison my grall if we ever married!"

Oelita blushed. "You would remember that! How can you remember things like that at a time like this!"

The Temple was opened up for the wedding feast. In concession to Oelita there was no meat. At Noe's wedding the three brothers had served roast leg of criminal and for Teenae's wedding a whole roast baby. There were tables of salads and baked beans, cakes and breads, honeycomb and pastes, and some very strange but aromatic stews concocted by Nonoep almost totally from a profane base.

The central floor of Sorrow's Temple was cleared for dancing as a string quartet arrived to play for the dancers. There were formal reels for ten, squares for eight, tricates for six, intricate weaves for four, and fast-paced yabas for two.

Humility stood by herself thinking that she might be bold enough to take Hoemei for the next yaba, but a bright young Kaiel woman took him instead, so she asked Joesai to dance, but he only laughed at the idea of them whirling together, and picked her up by the waist and set her on a ledge where she was tall enough to talk to him. She had never really become used to his size.

Oelita took Joesai away. She wanted to go to the tower and see the room from which she had escaped the Stgal. "Come with us," she urged, but Humility declined.

She watched Kathein from across the dance floor.

Then Gaet started to invite her to dance but three pretty women from Sorrow stole him away for the complicated weave. He was enjoying himself gluttonously.

She moved over to eavesdrop on Teenae who was with a group of her o'Tghalie clan, laughing. Teenae puzzled Humility, for she had no convenient place to put two-wife in the Liethe spectrum of women—perhaps because Teenae wasn't really Kaiel and she wasn't really o'Tghalie. She was having fun insulting her male relatives. No matter what they said, she topped them with a grin. They couldn't even make a crack with a hidden mathematical meaning without her catching it. They seemed to like her—though this was the family who had sold her to Gaet.

Humility wondered why she was so melancholy on this gay night. She decided to forget the maran and just enjoy herself. She found a young Kaiel who did a superb yaba, and then joined him later in the Red Canyon Reel. People noticed her dancing and called for her to do a solo and she obliged, but only because Hoemei was watching. Then she found her way back to the food and ate ravenously and disappeared into an unused game room where she stared at the boards. For a while she moved a Black Queen on an empty chess board, talking to it. Then she went to sleep. But even sleep did not please her, could not quiet her, and she wandered out of the Temple to find a place alone where she could watch the dawn come over the mountains. Noe found her there.

"I've been looking for you!"

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"I'm having a chat with Getasun."

Noe sat beside her on the stairs. "I've decided I like you."

"No, you don't."

"It is with apologies that I remember my rudeness to you."

"It doesn't matter."

"I was watching my marriage disintegrate and I was upset," explained Noe.

"Sometimes we are too close to something to see what is really happening," said Humility. "Who would let the maran break apart? We'd skin you alive and boil you in oil if you dared!"

"My marriage is precious to me," continued Noe simply.

"You have no fears from me."

"I didn't mean it that way. I really think you are loyal to us. That's why I like you. Loyalty is the most important thing a person can ever find."

"It is one of the importances."

"I think you helped us at the Palace. Did Aesoe ever suspect?"

"I am fond of your family," said Humility, obliquely.

"Where are you staying?"

"My room at the inn."

"Come with me."

"No," said the Liethe.

"I'm looking for Hoemei," Noe tempted.

"All right."

The wedding revelry was dispersing. Noe found her family in a tub in one of the tower rooms, scrubbing off their make-up. There was water all over the floor and they were splashing each other and shrieking. They were slightly drunk. "There she is!" shouted Gaet. "Get in the tub!"

"Not on your life!" said a grinning Noe.

"Get her in the tub!" Gaet ordered his family. A great naked Joesai and a little naked Teenae began to chase her.

She retreated down the hall, pulling her Liethe se-Tufi with her, and bolted the door of an apartment she had taken for herself. She was laughing. "I'm sitting this one out! I know what comes next! I've been to maran weddings before! I married those maniacs when there was only one of me!"

"Shall I give you your bath?"

"I'm a woman," said Noe, surprised that a Liethe would offer to bathe a woman.

"You're a priest, too. I'm a priest's servant."

Noe lit the fire for the hot water and sank down on the pillows. Humility began to undo her friend's elaborate hairdo. Noe stared at her in the mirror. "What a wife you'd make!"

"Would you like another wife?" Humility asked mischievously.

"God forbid!"

"What is it like to be married?"

"Well now," mused Noe, "if you are a single wife with three husbands . . ." She went into reverie. "They were always bringing home a new woman for the pillows on the excuse that they were looking to fill the empty wife slots. I think they had a great time. It made me sulk. How can you bring a new man home when you already have three of them? Now that the numbers are reversed with four of us and only three men, I think the situation will be interesting."

"You're naughty!"

"I always was a spoiled brat."

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Noe tried to draw out the real woman in her Liethe but found Honey opaque. She could talk music and art and dance, speak of philosophy, writings, politics, even science—but she was never personal. What kind of a childhood had she lived? She never said. She was as evasive verbally as she was quick on her feet. Noe decided to try a new tack against the same soft breeze.

"Do you like my touch?" Humility was asking, while she gentled Noe's neck in the hot tub-water.

"I'd give anything to be able to do what you are doing right now," said Noe. "Then my husbands would never leave me."

"It's a secret. I can't tell you. Then they'd never need to come see *me*."

"Let me offer you a Kaiel bargain. Teach me how to be a Liethe and I'll make you an honorary maran wife."

Honey hugged her briefly. "If you are a spoiled brat, you'd hate it. You have to be able to sleep on a hard floor. One night in my cell at the hive and you'd quit."

"And if I didn't?"

"Then I'd teach you more—like how to sit all day without moving a muscle either in tension or relaxation."

"That sounds like a fair exchange for giving you Hoemei when he comes home from a hard day at the Palace!" Noe laughed. She splashed out of the tub and wouldn't let Honey towel her. "Now it's your turn. Get in the tub and I'll scrub you!"

"No. I'll do it myself. You're the priest."

"Don't be ridiculous! I scrub Teenae all the time. Here; right now we'll do the ritual of making you an honorary wife and get it over with. Quick. Desert style." Abruptly Noe made the sign of loyalty.

Humility timidly returned the sign.

Noe took one of her small silver combs. "Here."

"I haven't any honeycake for you," said Humility, bewildered.

"I smuggled up some honeycomb. That will have to do." She rummaged around in a bag and brought out a sticky piece and gave it to her honorary wife. She opened her mouth. Humility put the fragment of honeycomb on Noe's tongue.

Noe then took a few strands of her hair and a few strands of Liethe hair. "You have to help me braid them." When they were finished she fixed the ends with bee's wax from her mouth. "*Now* get in the tub!"

Humility obeyed. "Do you tease your husbands, too?"

"All the time." She soaped Honey. "Now that I've fulfilled *my* part of the bargain, tell me what I have to do to become Liethe!"

"First you have to have a secret name."

Wanderer, popped into Noe's head. "I've got one. Shall I tell you?"

"No. Then it wouldn't be a secret."

"You sound like Teenae! What fun are secrets if you can't share them!"

"It would give me too much power if I knew."

"And you have a secret name?"

"Yes."

"And you won't tell me?"

"Even my sisters don't know it. Even my favorite crones don't know it. To be Liethe you have to have a *secret* name."

"You're *all* secret. I don't know any-

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thing about you. Why were you so sad during the wedding?''

''Nothing. I was thinking about growing old.''

''What happens to a Liethe when she grows old?''

''She gets to raise the young.'' Humility laughed and looked sidewise at Noe with her seducing glance. ''The children—like me.'' Then she added soberly, ''Our crones aren't any different from old men. They play politics and get the young to do their dirty work.''

Ah. She had said something so important that Noe dared not speak again immediately. She waited, mutely, until Honey was dry before pulling down the iron-reed blinds so that they might have some darkness to sleep by. Wordlessly she lay herself on the pillows, anticipating something, not knowing what she was expecting. Honey dropped close beside her, but did not let their bodies touch.

''Are you happy?'' asked Noe.

''Why shouldn't I be happy? It's my very first wedding night,'' replied Humility whimsically.

''Night? It's dawn.''

''What are they doing in the other room?''

Noe punched her. ''You know what they're doing! And we'd better get some sleep in case they decide to visit us!''

''They really wouldn't do that, would they?''

''You hope. I'll be generous and give you Hoemei,'' she teased.

They fell silent. Noe slept. Humility did not want Noe to sleep and touched her shoulder and woke her. ''I was reading one of Oelita's books. I felt very close to her. I like her. I don't like to see people die either.''

Noe took her strange Liethe in a comforting embrace. ''Some of us make our Contribution to the Race through Death, and others of us make our Contribution to the Race through Life. That's the way it has always been. Now go to sleep, little one.'' ■

● I say we have despised science. We are glad enough to make a profit of science; we snap up anything in the way of a scientific bone that has meat on it, eagerly enough; but if the scientific man comes for a bone or a crust to *us,* that is another story. What have we publicly done for science? We are obliged to know what o'clock it is, for the safety of our ships, and therefore we pay for an observatory; and we allow ourselves, in the person of our Parliament, to be annually tormented into doing something, in a slovenly way, for the British Museum; sullenly apprehending that to be a place for keeping stuffed birds in, to amuse our children. John Ruskin

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Jay Kay Klein's biolog

Time was, women scarcely existed in science fiction except as maidens in distress—often then in clinging or transparent spacesuits. There were a few fans, an editor of a minor magazine, a couple of writers—and no published artists. Now there are an increasing number of women in all categories, including artist Val Lakey.

She prefers to refer to the output of her pen and brush as the product of Artifact Studio, and most often illustrations are signed "Val Lakey/Artifact." The company was founded by her and two other illustrators living and working in Otto, N.C.

After graduating from Miami-Dade Community College, Val worked as an illustrator for Screen Gems/Columbia Music Publishers and as a freelance artist in Miami. Upon moving to North Carolina, the studio began building models for illustrations. Val's four-year-old son has grown up with aliens and monsters literally around the house. Val feels one of the more enjoyable aspects of illustrating is building space ships, hardware, and costumed models in spacesuits. "It's like reliving childhood fantasies with great props," she says.

Among Val's idols are Bernie Fuchs and N.C. and Andrew Wyeth. She would like to bring to science fiction a highly detailed, photo-realistic style.

Working from models built of clay, plaster, liquid rubber, plastic, and plasticene, she made a start first in *Isaac Asimov's Science Fiction Magazine* and later in *Analog*. The February 1982 cover (for Donald Kingsbury's *Courtship Rite*) is Artifact's first cover for *Analog*, and the studio would like to hear from people who appreciate their efforts. ■

Val Lakey

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the reference library

By Tom Easton

Voyagers, B. Bova, Doubleday, $14.95, 391 pp.
Tomorrow's Heritage, J. Coulson, Del Rey, $2.75, 374 pp.
Starship & Haiku, S. Sucharitkul, Timescape, $2.50, 207 pp.
Sunwaifs, S.J. Van Scyoc, Berkley, $2.25, 214 pp.
Heirs of the Kingdom, K. Hudner, Holt, Rinehart and Winston, $12.95, 270 pp.
The Sword of the Lictor, Gene Wolfe, Timescape, $13.95, ? pp.
The Terridae, E.C. Tubb, DAW, $2.25, 160 pp.
Father to the Stars, P.J. Farmer, TOR, $2.75, 319 pp.
The Berkley Showcase, Vol. 4, V. Schochet and J. Silbersack, eds., Berkley, $2.25, 199 pp.
Chrysalis 9, R. Torgeson, ed., Doubleday, $10.95, 186 pp.
Anatomy of Wonder, 2nd ed., N. Barron, ed., Bowker, $32.95 hb, $22.95 pb, 720 pp.
Life in Darwin's Universe, G. Bylinsky, Doubleday, $17.95, 238 pp.

I've just read Spider's farewell address, in the November issue. What an image! He has finally got that freight train off his mid-section, and he's wishing it on me! Thanks, Spider. Lots.

But seriously, folks. I don't seem to have his problem. I would read a lot of SF even if I weren't your genial, cold-nosed reviewer. This way I get it free, and I figure the column takes a couple or three days a month. It leaves me time to teach a little and write a fair bit. This year (1981) has seen maybe 150,000 words come out of my typewriter —there's perhaps 200 pages of an unsold novel, a pair of nonfiction book proposals, half a dozen stories, a dozen articles, *and* all those columns. I've even managed to stay even with the bills.

But writing *is* a mug's game, gang. If you're not selling books, you're not saving much at all for the inevitable

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rainy days. And I'm not. So I have my eye out for a full-time (horrors!) job somewhere. An assistant professorship, not a part-time instructorship, at the university, if the bean-counters can ever get over the idea that part-timers are cheaper (no fringes, you see, and the pay is minimal, too). And then there's the Office of Legislative Assistants over at the state capitol. They advertised a while ago, I sent in my resumé, and I have an interview in a couple of weeks. The pay's good for this area. The hours—well, I hear that when the legislature is in session, researching and writing reports and bills can take up to 120 hours a week. That leaves just under seven hours a day for food, sleep, family, and SF, but they make up for it by giving you extra weeks off later. They'd better.

Obviously, if I get the job, my writing will suffer. Some months I'll even have trouble getting this column done.

But it won't be the column that feels like a freight train.

I'll keep you posted. In the meantime— Are you listening Stan? Hadn't you better start thinking about finding another alternate? You do want to be ready when and if I start screaming, don't you?

Those of us who belong to the SF community have to be disturbed by a trend that has emerged over the past decade. Ever since the Apollo program peaked in 1969, the U.S. space effort has been declining. It is as if those who cry that the money is better spent right here on Earth have won, despite all the benefits that have come down from space. (Resource surveying, weather monitoring, and navigation satellites alone more than justify all the dollars ever spent by NASA.) It is as if our government is blind and deaf, or as if those who know the direction of prosperity and destiny fail to make themselves heard.

We are withdrawing from the cosmos even as our foot touches the threshold. At the same time, we are isolating ourselves from our fellow humans, cutting back on foreign and domestic aid, refusing to support multinational efforts to develop alternative energy supplies, refusing to condemn unsound practices such as the hard-selling of infant formula in undeveloped countries. We are reinventing isolationism.

You nod your head. You say, "Of course!" You ask, "But how does this connect to a book review column?"

You should know better. Don't I always connect my sermonettes to books? And this one is no exception, for I find the isolationism I mention appearing not only in the real world, but also in SF. I find it under the names of Clarke and Simak and many more. Sometimes it is a passive reflection of reality, an embodiment of national mood, a partner in a criminal conspiracy. Sometimes it cries out against the reality, as do my two examples this month.

What kind of isolationism am I talking about? In traditional SF, man meets alien in the outward push. He is going outwards, away from the center, actively pursuing his destiny among the stars, and he finds Others. Is the alien friend, enemy, or neutral? That much does not matter. The relevant point is who finds whom.

What I see is a surge in the number of stories in which humanity stays home and the alien is the discoverer, the visitor. Some say, "All things come to he who waits." Others ask, "Is this the only thing that will get us off our butts?" Look at Ben Bova's **Voyagers.** Astronaut-astronomer Keith Stoner finds that strange signals come from an alien

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starship, wants to announce the discovery, and gets SECRET stamped all over him, but still winds up Earth's emissary. The plot is complicated by love entangled, proud venality, and power politics. Soviet assassins stalk Stoner to keep the alien technology from Western hands. Soviet allies plot to protect our hero. And in the end there are signs that one brave sacrifice may end Earth's isolationism.

That's a cryptic summary, but it will have to do. Too much would spoil your enjoyment, and besides, Spider covered it last November. Let me add only that Ben's argument for destiny recognizes all the forces that try to thwart it. In the process, he produces what is probably his story's major flaw—everything works out too neatly. But that is a characteristic of most novels and the major difference between fiction and life. Isn't it?

Look too at Juanita Coulson's **Tomorrow's Heritage,** book one of a "family saga" series called "Children of the Stars." Her Earth is a revenant emerged from the ashes of war and disaster. Nations and continents are restructured, and the science is a bit beyond our own. The people are the same, and the central characters are the Saunders, survivors of an Edison who created the story's world almost alone with his inventions. Jael Saunder is the power-broker widow. Son Patrick is the charismatic politician. Son Todd is the idealistic head of a satellite-based communications empire. Daughter Mariette is the driving force behind an O'Neill-type space habitat.

Patrick's party is the Earth-Firsters, committed to stopping expansion into space. When Todd contacts a mysterious spacecraft and spreads the news, panic strikes and the Firsters increase their power. Todd and the habitat are attacked. Todd fights back by exposing conspiracy and fraud and by tearing the heart out of his family. In the end, the surviving Saunders stand ready to lead the species to the stars. Book two of the series will be *Outward Bound.*

Though Coulson's alien messenger is so buried beneath a viney tangle of family conniving that it seems no more than a device, something of secondary importance, she and Ben do share a theme. Their books differ in part in focus, in the attention they give their aliens. They are for different readers. Do you like technical matters? A stress on the importance of device and consequence? Then read **Voyagers.** You'll enjoy it. Do you prefer family convolutions, personalized emotion, a stress on the importance of people? Then read **Heritage.** You'll enjoy that one. Both are good, but of the two, *Heritage* strikes me as the more unlikely. The day is past when one man or woman could develop or run a high-tech operation, and that book is predicated too much on that Edisonian assumption. Ben plays up the team; he is thus more believable. And, as Algis Budrys said, *Voyagers* may be his best work to date.

Somtow Sucharitkul's **Starship & Haiku** offers a domestic alien and a strange encounter. Earth reels among the ashes of nuclear war and the contagions of lab-born plagues. Japan survives, largely untouched but aware that humanity's remaining time on Earth is short. A secret project is preparing ships to carry a remnant to orbit and rendezvous with a starship built but never used by the Soviets. Less secret, a madman is encouraging his fellow Japanese to bow out honorably, by suicide. Society is crumbling.

The ship-builder's daughter is Ryoko. Sent on a journey to visit Western

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ruins, she is bespoken by a whale. It emerges that the Japanese spirit is what it is because they were created by the whales as a sort of hybrid. Now both peoples are dying by their own wills, fascinated with death, but a few will survive. The whale then loads Ryoko's ovaries with fertilized eggs that, properly handled, will engender a new hybrid in space.

Now that is far-out enough to make any sane reader wonder just what Somtow's been smoking. But the story is a potent one, owing much to its portrayal of life among the dying, of a seed struggling to sprout through the ashes and blossom anew. It is a story of regret and atonement and promise, an autumn story. I enjoyed it. I think you will too.

Sydney Van Scyoc's latest is **Sunwaifs.** The scene is the planet Destiny, a world of hostile ecology into which human colonists must fit. A solar flare produces mutant children, of which six survive. One is a seer. One commands plants, another beasts. One is a healer, another mistress of crybirds and palemoths, eaters of the mosses that bring madness. Last is the storm mother. Mythic archetypes all, and their function is to reconcile people to world, human god to Mother Destiny and Father Sun. Such was the function of the originals on Earth, though hardly in so literal a sense.

The novel is not an action story, though there are elements of violence. It reports the birth of the sunwaif-gods, their discovery of power, their rejection by mere humans, and their ultimate acceptance. It is a relatively quiet tale, a pastoral if you will, dwelling on growth and maturation, on the finding and fitting of context. If it does not totally satisfy, that is because it lacks a resolution. The story stops, open-ended, when the characters have their roles, when they have begun to mate, when their demigod (supergod?) children are in the wings. In fact, the story is framed as a warning: "Here is what happened to the first generation of saviors. We were nearly destroyed. We nearly destroyed you all. Learn from our story, that you may be ready for the second generation."

If the sunwaifs are gods from Earth's myths, then who will their children be? Can we look for some parallel to the secular gods who emerged from the Renaissance? Can we look for artists and scientists and philosophers? Whatever, they must be a part of their world in a way we Earthlings have never been! I hope that Van Scyoc plans a sequel, for I would like to follow this writer's vision.

Kennedy Hudner is a young Connecticut lawyer. **Heirs of the Kingdom** is his first publication, according to the jacket copy, presumably taking precedence even over legal matters. Some lawyer. Some story, too, and I hope it promises many more.

According to Hudner, about a millennium ago, a radiating meteorite sparked a human mutation, from which grew the race of Riis. The Riis come in three varieties, the sarnit, melior, and kivtle, each with its own mental powers. They are potent, but they face extinction because pollution and food additives make them sterile. A Riis researcher finds a drug that can turn ordinary humans—or their offspring—into melior or kivtle, but not sarnit. If the drug is used to save the Riis, the sarnit will remain doomed, and they object.

A quasi-governmental security agency gets wind of the drug research, thanks to mysterious phone calls, and raids the lab. The researcher escapes with the

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drug, though, and the chase is on. And what a chase! Half a dozen parties seek the same thing, and an unknown figure behind the scenes manipulates them all (he may be Martin Bormann). There is an innocent bystander who, caught in the gears, decides the ultimate confrontation in a way that forces a sequel. If it's as good as this, Hudner's writing career is off to a blazing start.

Heirs moves briskly and well. It is full of intrigue and tenterhooks. It is a good read. But I can quibble with its premise: each Riis, it seems, can be parent to sarnit, melior, or kivtle; the individual's nature emerges only at puberty. But a drug that makes humans into melior or kivtle is supposed to extinguish the sarnit. What about the converts' kids? If the converts are truly Riis, won't there be sarnit among them? What's all the fuss about?

Perhaps Hudner can explain my plaint away. If so, he should have done it in the book; I don't think I missed it. You may not care, and in fact this flaw doesn't really hurt the story. Take the author's fix for granted and read on. You *will* enjoy.

Progress report: Gene Wolfe has now published Volume 3 of his Book of the New Sun tetralogy. It's **The Sword of the Lictor,** and it continues the travels of Severian the Torturer. Severian and the reader both learn more of the Earth of eons hence as Severian reaches his post at Thrax, rejects it when asked to kill an innocent woman, and enters the wilderness, where he loses his healing gem, the Claw of the Conciliator; confronts the cacogens, aliens who may be Earth's true rulers; and broadens his mind and awareness in further preparation for his ultimate destiny.

Sword seems less cryptic than the last volume, though it offers the same wealthily esoteric vocabulary. Perhaps the mysteries become more familiar by repetition. Perhaps they are explained by imperceptible degrees. Wolfe does fit into his tale a great deal of background in a way that seems to correspond far more to real life than to fiction. History comes to Severian's thoughts only as events remind; there are few scene-setting lectures of the sort so common elsewhere, and the reader must be as patient as if he or she were truly a passive observer of a living mind. The patience is rewarded; by now the reader's awareness of Severian's Earth is as rich as that of his own. Wolfe's fictional world seems very real.

The writer's skill is as fine as ever. There is a scene here that evokes a sense of an ancient Earth as it is rarely done in fiction. Severian descends a cliff, passing the strata of civilization, layer upon layer of rock and fossil bone and crumpled artifact and architecture and mosaic art. In the unimaginably distant future, just such layered mountainsides will surely exist, provided only that we continue as a civilized species or are succeeded by others.

Timescape promises Volume 4, *The Citadel of the Autarch,* for fall of 1982. I wish I didn't have to wait.

E. C. Tubb's saga of Dumarest of Terra is now in its 25th installment: **The Terridae.** Has he found Earth? Not yet, but he *has* found a group whose lives center around a cryogenic wait for Earth's discovery. They know the signs of the zodiac, and they have an archive that awaits Dumarest's attention. At story's end, the Cyclan has been foiled once more, his present love survives, and the Terridae appear ready to share his mission.

Is the end near? Only Volume 26 will tell.

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* * *

When Jim Baen left Ace, he joined a new outfit, TOR Books. TOR's first products are now available, distributed by Pinnacle. They seem to be mostly reprints, but that's not necessarily a bad sign at all. Among them is P.J. Farmer's **Father to the Stars**, a collection of tales from 1953-1961 concerning one John Carmody, a sociopath who becomes a priest. Father Carmody's model seems to be a blend of G.K. Chesterton's Father Brown and his nemesis, Flambeau, the master criminal who became a detective. The parallels are not pronounced, but Chesterton's characters did come to my mind as I read. If you know them, that's all the recommendation you need.

But let's go on for a moment anyway. SF stories often seem to find roots in non-SF. We have, perhaps, one example here. Laurence Janifer says his Gerald Knave stories are based on Charteris's Simon Templar (the Saint). My own Howie and the Mayor series begins from Arthur Macdougall's Dud Dean tales. There are more, with Dracula and Holmes prominent among them. The roots are not always obvious, but they are there, and they demonstrate that for all the talk of a SF ghetto, SF does not exist in isolation. (There is plenty of other evidence of that as well, of course.) I only wish I knew of a case or two where the modelling goes the other way; that would show that the cracks in the walls around SF do not open in only one direction.

For anthologies this month, we have **The Berkley Showcase, Vol. 4.** This one has an untypically light piece by Jack Dann, "Fairy Tale" ("What's green and red and goes sixty miles an hour? Shtumie! A frog in a blender.") There's Pat Cadigan's "The Pathosfinder," in which telepathy serves to give an actor heart, or tries to. There's Doris Vallejo's "Seduction," of love with a vampire, and Phyllis Gotlieb's "Blue Apes," which examines a colony's adaptation to a world, and its price. There are some good stories here, and some not so good—or less appealing to me. Many are marked by the "artistic" surrealism that seems to characterize this anthology. Sometimes it's a little hard to take.

Roy Torgeson's **Chrysalis 9** has an Orpheus remake by Somtow Sucharitkul, "A Child of Earth and Starry Heaven." Glenn Chang's "Dancing in the Dark" is another alien contact story that connects to what I said earlier about isolationism; here the alien is a plasma that takes over a sentient computer; the ending explicitly echoes *Voyagers'*. Cynthia Felice's "A Good Place to Be" is an excellent evocation of the horror of possession. Karl Hansen's "The Ballad of Lady Blue" precedes other elements in his future of peptide addicts and bioengineering and follows others; it makes much clear. And more. There's some surrealism here, but less than in *Showcase*. The tone is more pragmatic, more *Analog*-ish perhaps.

Neil Barron's **Anatomy of Wonder** is now in its expanded, updated second edition. For those who know it not, it is a compendium of essays and novel synopses. It is an excellent aid to the scholar, student, and curious reader. Want to know the history of the field? See the essays on periods. Want to know about children's SF? Foreign SF (German, French, Russian, Italian, Japanese, and even Chinese)? Cataloging, indexes, biographies, film, TV, classroom aids? It's all here, along with some 2,000 synopses of "key works." It's

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a useful book, and one I won't give away.

For nonfiction, I offer you Gene Bylinsky's **Life in Darwin's Universe.** It's being touted loudly, with high praise from the likes of Robert Jastrow, René Dubos, and Isaac Asimov. And it's good enough. It is a brief, breezy survey of the origins of the universe, Earth, and life, a scan of evolution and its oddities, and an attempt to guess what life on other worlds might be like. However, the guesses are too stuck on the variations visible on Earth, with paintings of koala-men, skink-men, and bat-men. Too, the book reads almost as if the author were a writer for the *National Enquirer* instead of a science editor for *Fortune*. I point to the errors in his statements that a horse with six legs "would stumble all over" itself, that bacteria have light receptors with lenses (he means protozoa), and more. He treats the idea that Earth was once all sea, landless, as if it were established fact. He is fond of the forced WOW!! as in "Even on Earth, where the seas now cover not the whole planet but 71 percent of it, a remarkable 150,000 of our planet's nearly 2 million species are found in the oceans" (p. 112)(what's so remarkable about 10 percent of life occupying 71 percent of space?) and "Ants can be taught to run mazes too. And they learn only two or three times slower than rats" (p. 125)(I'm not impressed).

Picky, picky, Easton. It's breezy, okay? It's a popularization. It's for the market that does *not* read *Analog*, or even SF, or even the science pieces in the daily paper, I trow.

I'd be happier if it were billed as a juvenile. ■

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brass tacks

Esteemed Stanley Schmidt:

Please print at least some portion of my letter. You will be doing a favor for writers everywhere, for I know I'm not the only one with this ethical problem.

I was one of those girls who started reading science fiction around age 10. I gained my first understanding of physics from Ley, Hoyle, Blish, etc. It didn't help me in high school; my understanding of math stopped at $3x + y = 17$. In the '50s girls were not expected to have math capacity, so I took something easier, foreign languages, and continued reading *good* science fiction.

I'm very disappointed in Carl Sagan. He makes so many errors in astronomy that I no longer rely on him to give me accurate information. My modern hero(ines) are: C.L. Strong, Kaufmann, Murdin, Payne-Gaposchkin, Henbest, C.W. Allen, and the beautiful Timothy Ferris (bless him for writing *The Red Limit*); people who care enough to write for the intelligent lay reader. Through them I have understood Hawking, Penrose, Wheeler, Planck, Schwartzchild, Chandrasekhar, and Kerr well enough to write a research paper on black holes. There are no black holes in my story; besides, my problem is not astronomy or physics.

My problem is that all my knowledge is abstract. I've never seen an oscilloscope, flown a plane, or operated any earth-moving machinery. I don't have the instinctive feel of *rightness* that any engineering major would have.

Last summer I queried a *lot* of editors about discrepancies in measurements and the possibility of a basic science service where, for a fee, one could get generally accepted information on a variety of subjects. All but Stanley Schmidt said in essence: "Ask your teachers, or other experts, but remember that they are giving you valuable time, so don't

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bug them." Thanks a lot. I already know more than some of my teachers, and I absolutely refuse to follow learned professors around asking: "Please, what does a rheostat do?"

Only the esteemed Stanley Schmidt said: "Measurements differ because our technology is not yet perfect." He also said that science isn't as cut and dried as it's sometimes made out to be, thus confirming my former opinion of him.

Alas, all editors agreed that no such basic science service exists. I think the time is ripe for one. I don't need the "cutting edge" of astrophysics; I want a story that will read as well 20 years from now.

Let me put it like this: I'll never be a Hal Clement, but I aim to submit a story he could read without wincing.

Example: A character is burned by "alien" electricity, which leaves a distinctive pattern of burns. Now, the wonder of science fiction is that "alien" electricity might do anything. That's not good enough for me. If the effects are not consistent with electricity as we know it, I will gladly change the imagery to something grittier and more real. I have a transceiver on my ship, because I understand the function, but no rheostats or other things. I've tried to teach myself electromagnetism, but I can't handle the math. My understanding of electricity is as vague as that of a 10-year-old observing a telephone wire and a puddle of water.

Example: My characters fly through a planetary fissure over 15 miles deep. It's not on Earth, but it's in our galaxy. My skimpy description is taken from a borrowed geology book. I don't want the latest jazz from Saturn's moon, just a generally accepted best guess of what the strata would most likely look like.

As a three-year+ writer, I can tell other struggling writers that all the writers' services, even those aimed at the SF writer, only tell how to get a story past an editor. Not one word about tightening up elementary gaps in science. It's time for a co-op of, say, engineer, intern, biologist, law student, to make a decent profit assisting writers like me who are lopsided in their knowledge but who want the science to be accurate. You can't extrapolate into the future if you don't understand the present.

My personal experience with the working scientist is that, far from being stuck up, they are (pardon my frankness) entirely too damn modest. They are so aware of how much they don't know that they hesitate to commit themselves. They forget that to the non-specialist, their knowledge is immense.

Another summer is over; I have returned to my paying job. Teaching children to read is so intellectually demanding that I have no time to chase through libraries. If I take another year doing research, some other writer will beat me to my hot story line, the one part I can't change. As I tap away at my short final copy, I'd love to bring it up to book length with some nice solid scientific "padding." I refuse to add extra plot complications or unnecessary dialogue just to get 200 pages.

Good writers gladly share their secrets, for they believe that by doing so they improve the general level of writing. Any underpaid scientists out there who would like to help improve the general level of science fiction writing?

C.M. FITCHETT

Sacramento CA

An intriguing and potentially worthwhile idea, though there's some question about the consultants being able to provide the service at a price writers can afford to pay and still make a profit on their own work. Anybody out there want to give it a try?

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Dear Stanley Schmidt:

Although it's an ingenious theory, John Cramer doesn't need anything so strained as territoriality to explain the American public's loss of interest in space. The simple answer is television. With minuscule exceptions, the public saw the effort only on television, as entertainment. Commercial television has had about thirty years to condition its audience to story format (have you noticed how even news commentators have gradually come to be characters in a continuing semi-soap-opera, with plugs for each network featuring its reporters at home and at play?).

The format is simple: there's a set-up explaining the problem, there's story development aimed at solving the problem, there are a few hitches and with any luck a chase, then there's a solution. The moon shot fit the format admirably. For a while there, it was better than who-killed-J.R. All those neat, ghostly special effects with space-suited people jumping around in low gravity at the end, and the whole world watching and stopping Americans on foreign streets to congratulate them (I was in Mexico that July). But then the show was over. They got there, didn't they? Fadeout. What, you mean there's still more to the story? Oh, well, it can't be very interesting or we would have heard about it; we saw the climax so let's go out for a beer.

It took Europe some twenty or thirty years to work up any effective interest in following up on the voyages of the Pinta, the Niña, and the Santa Maria, during which they jailed Columbus a couple of times (at least John Glenn got to run for Congress). So don't give up hope yet. It's still early. *Do,* however, start to worry about the distorting effect that the mass perception of the world through television may have on the nature and fabric of reality.

SANDRA ODDO
Director
Sun words Editorial Services
Hurley, NY

Dear Mr. Schmidt,

Your 9/14/81 editorial, "Who Pays the Piper," is interesting and provocative. I'm pleased to see the subject of R&D and cultural financing broached in your pages. I agree that, wherever and to the degree possible, financing should be linked to results by a feedback mechanism.

Among ways of paying the piper, those involving *government* grants are morally repulsive to me, because the money involved is taken by force through taxation. In a world without such coercion, where people wouldn't be forced to pay for things they don't want (e.g., MX missiles, school busing for integration), much more money would be available for projects in the arts, sciences, and technology. Relief from taxation would also spur those investors in R&D who could internalize at least some of the benefits to invest with hope of monetary gain.

One disincentive to basic research today is the human life span. However, as we continue to extend the average lifetime, the chance that any particular investment will bear fruit in that investor's lifetime increases.

In the same *Analog* issue, Joe Haldeman pulls a pair of boners in his otherwise satisfying "A !Tangled Web." First, Swiss chocolate isn't devoid of protein or fat. In fact, Geigy *Scientific Tables* list either plain or milk chocolate as having 40% protein + fat by weight—presumably enough to give the !tang a bad trip. For a good !tangish

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"high," I'd recommend rock candy with a vodka chaser.

Second, the diagonal of a 1:2 rectangle lies at about 26.5° to the long side, not "a satisfyingly Euclidian thirty degrees." In a rectangle whose diagonal *does* lie at 30°, the ratio of the short side *to the diagonal* is 1:2, while the ratio of the short side to the long side is 1:3½.

Mr. Haldeman, you die. Your trophies go to a hockshop, where somebody cuts a hand on one and gets tetanus. . . .

Sincerely,

ROBERT GOODMAN

Bronx NY

O the embarrassment!

Dear Mr. Schmidt:

Bravo! I have just read your editorial in the September 14 issue of *Analog*. I was delighted to hear someone defend the rights of the art consumer for a change, I, too, have noticed the outstandingly mediocre products of grants, not only in music and science but also in painting, literature, sculpture, education—you name it! I've also noticed that the "artists" who scream the loudest about "crass commercialism" and the "slavery of the patronage system" are simultaneously ignoring the fact that government is now the patron.

You know the ones I mean: the ones with generous grants to spend six months coming up with something their own mothers wouldn't hang on the wall.

I would like to bring up something not considered very deeply in your fine editorial, which I believe (from experience in several bureaucracies and from my studies in political science) strikes to the heart of the matter.

Under the patronage system (or even "crass commercialism"), money is provided to the artist by a lover of art. There is generally a direct contact (as you noted) between the art-maker and the art-lover.

When we talk of grants, we tend to think of a block of money floating down from some institutional heaven; often we forget it's all decided by a few human beings (sometimes only one) in an office somewhere. While they may be artists (?) themselves or, at least, art lovers, they are far more likely to be bureaucrats. As bureaucrats, they are highly qualified to survive within bureaucracies and play games with budgets and not necessarily anything else. Yet these are the "pre-arbiters" of artistic taste. What we have here is a question of accountability.

If a "patron of the arts" wastes his money on a crank—well, his money, his business. When outlets such as your own produce the work of cranks, they succumb to inexorable laws of survival, thus they are immediately accountable. But when a bureaucrat, hiding behind the nebulous name of a government institution, spends my (tax) money on an untalented narcissist bent on public displays of intellectual onanism, what recourse is left to the consumer? Thank you for speaking out!

CHARLES WENTWORTH

Columbia SC ■

● The feeble-minded are people who know the truth, but only affirm it as consistent with their own interest. Apart from that, they renounce it.

Pascal

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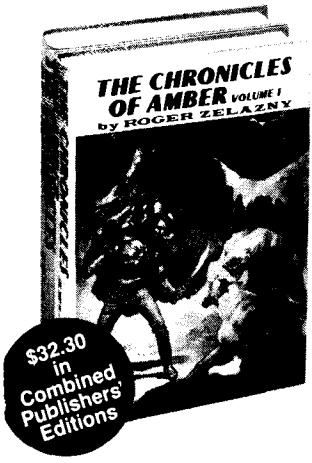

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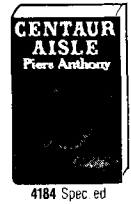

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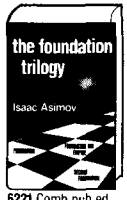

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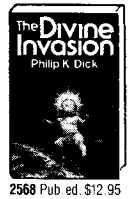

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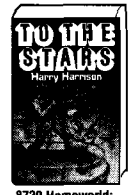

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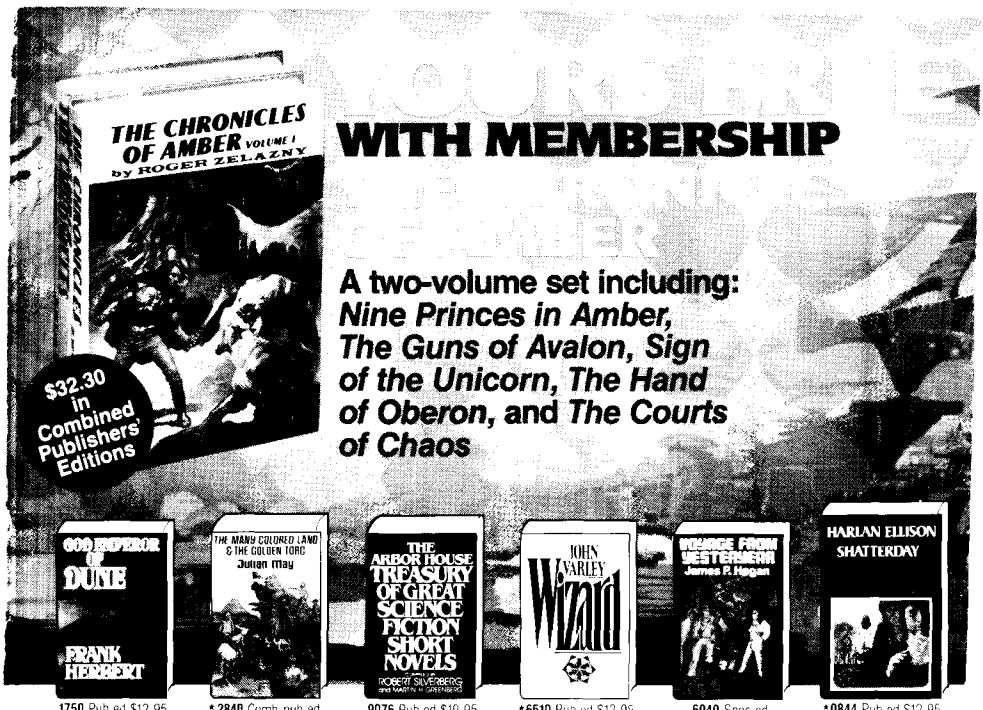

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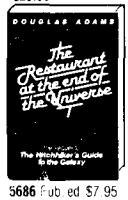

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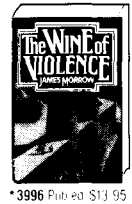

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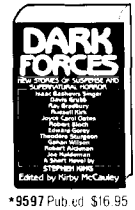

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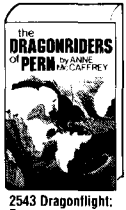

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